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## OLEUM ÆTHEREUM AND SPIRITUS ÆTHERIS COMPOSITUS.

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In using the U. S. officinal formula for ethereal oil some years ago (1853) for the first time, six charges of a large glass retort were worked off, each charge containing three times the quantity prescribed in the formula. Three of these charges were managed in strict accordance with the directions of the Pharmacopœia, and three without the prolonged contact of the materials. In the first three the oily stratum was underneath and measured 3½ f.3. This yielded 841 grains of finished oil of s. g. of 1.129 at 70°.

In the last three the oily stratum was uppermost in the receiver, as indicated in the officinal formula. It was of a darker color and less dense than the first, and yielded 704 grains of finished oil, s. g. 1.12 at 70°.

Thus 4½ gallons=27 lbs., 4 oz. av. of alcohol of a s. g. .830, and 6½ gallons=101½ lbs. av. of sulphuric acid of a s. g. 1.845 yielded 3 f.3 scant, =1545 grains of finished oil=.81 per cent. of the weight, or .52 per cent. of the volume of the alcohol employed.

A specimen of this oil preserved appears to have undergone little change except in color. From being nearly colorless it is now of a dark brown color. When stirred with water it separates at once without perceptible diminution of volume. The water, however, is rendered cloudy by solution of chloride of barium.

Not satisfied with the yield of this operation, other proportions and manipulations were resorted to, and in the next following operation (of 1854) 2½ gallons=17 lbs. av. of alcohol s. g. .835 with 80 pints=56½ lbs. av. of sulphuric acid s. g. 1.848, di-

tilled in two charges, after prolonged contact, yielded 3 f.℥ of crude oil, or 9 f.℥ finished oil. This was not regarded at the time, however, as a fair experiment with the proportions used, as the two charges yielded very unequally, though the cause of the inequality was not then detected.

At these rates of yield,—and the manipulation was not very faulty,—Hoffman's anodyne cost about one dollar per pound.

In the next operation (1855) the proportions of Serrulas as given by Brande were adopted; namely, "1 part alcohol to 2.5 parts concentrated sulphuric acid." In this, 7 pints = 5 lbs. 14 oz. av. of alcohol s. g. .835 and 8 pints = 15 lbs. av. of sulphuric acid s. g. 1.845, distilled after prolonged contact, yielded 1 f.℥ of finished oil s. g. 1.16, or .9 per cent. of the volume of the alcohol used. The density of this oil is greater than that of any known authority. It was purified, after 12 hours exposure, by frequent washing with distilled water at first rendered very slightly alkaline, and then by drying in a partial vacuum. A specimen preserved, has undergone the same change of color with the first, but appears otherwise unchanged.

At the next following operation (1855) a set of comparative experiments was determined upon, and ten charges were worked off in the same retort, and under similar circumstances as far as practicable.

The first five charges were nearly in the proportion used by Serrulas.

1st charge. Alcohol, s. g. .832 at 62° 124 f.℥ = 6 lb. 8 oz. av.  
 Acid, " 1.842 " 65° 135 f.℥ = 16 " 4 " "  
 distilled after prolonged contact, yielded 2½ f.℥ of crude oil, or 7 f.℥ of finished oil s. g. 1.1466 at 72°.

2d charge. Alcohol, s. g. .835 at 58° 125 f.℥ = 6 lb. 9 oz. av.  
 Acid, " 1.842 " 65° 136 f.℥ = 16 " 6 " "  
 distilled without prolonged contact, yielded 5½ f.℥ of crude oil, or 6 f.℥ = 395 grains of finished oil, s. g. 1.129 at 72°.

3d charge. Alcohol, s. g. .835 at 58° 126 f.℥ = 6 lb. 12 oz. av.  
 Acid, " 1.846 " 60° 142½ f.℥ = 16 " 14 " "  
 distilled after prolonged contact, yielded 9 f.℥ of crude oil, or 4 f.℥ = 252 grains finished oil s. g. 1.066 at 72°.

4th charge. Proportions and materials same as third, distilled after prolonged contact yielded 14 f.℥ of oily upper stratum, or 10 f.℥ = 651 grains of finished oil s. g. 1.0866 at 72°.

5th charge. Proportions and materials same as the third, distilled after 6 hours (instead of 12 to 24 hours) of contact yielded 17 f.℥ of oily stratum, or 10 f.℥=646 grains of finished oil, s. g. 1.0645 at 72°.

In this operation 634 f.℥ of alcohol and 83½ lb. of acid yielded 37 f.℥ of finished oil, or .73 per cent. of the measure of the alcohol used. The preserved specimens of these products have all undergone similar change of color to those before mentioned, except that the last three of the five are of a different deeper color, very much like that of aromatic sulphuric acid. Blue litmus paper is not affected by any of these specimens until the moistened paper has been exposed for a few moments, when it becomes red. In this reaction these last do not differ from the earlier specimens, although in these no alkaline solution, but distilled water only, was used in the washing.

In the following series of three charges the proportions of the U. S. Pharmacopœia were pretty closely observed, the quantity of alcohol being the same as in the last series.

1st charge. Alcohol, s. g. .832 at 60° 125 f.℥=6 lb. 8 oz. av.  
Acid, " 1.842 " 65° 188 f.℥=23 " 0 " "  
distilled after prolonged contact, yielded 9 f.℥ of crude oily stratum (below), or 5½ f.℥ of finished oil s. g. 1.1463 at 72°.

2d charge. Alcohol, s. g. .835 at 58° 125 f.℥=6 lb. 8 oz. av.  
Acid, " 1.842 " 65° 174 f.℥=20 " " "  
distilled without prolonged contact yielded 8 f.℥ of crude oily stratum (above), or 1 f.℥=505 grains of finished oil s. g. 1.0708 at 72°.

3d charge. Alcohol, s. g. .835 at 58° 126 f.℥=6 lb. 12 oz. av.  
Acid, " 1.846 " 60° 189 f.℥=22 " 8½ " "  
distilled after prolonged contact, yielded 4½ f.℥ crude oily stratum (above), or 3½ f.℥=242 grains of finished oil, s. g. 1.0592 at 72°.

In this series 379 f.℥ of alcohol and 66 lb. of acid yielded 17½ f.℥ of finished oil, or .57 per cent. of the measure of the alcohol used. Specimens from the product of these charges have all become decomposed, and separated into two strata, light colored below, and dark reddish brown above. The sensible properties and reaction with litmus paper of the dark portion, are the same as in the other specimens. The lower stratum is more oily, strong-

ly acid, and when dropped into water is much diminished in bulk; and the water used reacts strongly with solution of chloride of barium. The proportion of this lower stratum to the upper is in ratio of the original s. g. of the specimen.

In the two charges next following the proportions of the London Pharmacopœia as given by Pereira, are closely followed, the quantity of alcohol still remaining the same as before.

1st charge. Alcohol, s. g. .835 at  $58^{\circ}$  126 f.℥ = 6 lb. 12 oz. av.

Acid, " 1.846 "  $60^{\circ}$  116 f.℥ = 13 " 8 " " " distilled after prolonged digestion, yielded 18½ f.℥ of oily stratum (above), or 4 f.℥ = 270 grains of finished oil s. g. 1.0667 at  $72^{\circ}$ .

2d charge. Proportions and materials the same as the first, distilled without digestion yielded 22 f.℥ of oily stratum (above), or 6½ f.℥ = 408 grains of finished oil s. g. 1.0933 at  $72^{\circ}$ .

In these the alcohol yielded .52 per cent. of its volume. Specimens of these oils are decomposed like those of the last series.

These experiments, though very unsatisfactory in their results, were considered to have established the proportions given by Serrulas as the best,—the utility of a prolonged contact of the materials,—and the sufficiency of washing with distilled water only, in the purification.

Therefore, in the operation of 1856, four charges were worked off, with an aggregate of materials, as follows:

Alcohol, s. g. .821 at  $60^{\circ}$  4 gallons = 27½ lb. av.

Acid, " 1.834 "  $60^{\circ}$  4½ " = 68½ " " "

The yield from these was 44 f.℥ of crude oily stratum (above), or 4½ f.℥ = 2280 grains of finished oil, s. g. 1.097 at  $60^{\circ}$ , or 1.2 per cent. by weight, or .88 per cent. by volume, of the alcohol used.

In a subsequent operation, and the last, the yield was 1.32 per cent. by weight, or 1 per cent. by volume, of the alcohol, with the above proportions; and these results are now regarded as the expression of all the skill and knowledge of the writer on the subject, after having watched it with accumulating experience and close observation, stimulated by disappointment; for this best yield is but little over one-third of that stated to have been obtained at Apothecaries Hall, London; and by Mr. E. N. Kent, (Amer. Jour. Pharm., 1852, p. 257,) on the very small scale.

Early in the management of this preparation it was observed



that washing with solution of potassa of the prescribed strength decomposed some of the oil, or rendered it soluble to a certain extent.

It was next noticed that the fuller the retort the larger the yield; and this is probably due to the fact that the oil must be mechanically carried over with the vapors from being produced and distilled at a temperature much below its boiling point. A shallow leaden still would doubtless give a larger product.

The accurate management and regulation of the fire and temperature by an immersed thermometer, was the next step attained; and finally, it was observed that when the sulphate of lead precipitated from the acid on dilution, was suffered to separate completely, and was carefully excluded from the retort, the yield was at least one-third greater. Indeed, such an influence has this small precipitate upon the viscosity of the boiling mixture toward the close of the process, that when excluded, and the temperature carefully managed no frothing up occurs, and the boiling can be continued until only uncondensable gases pass over. This is the most important fact yet arrived at in connection with this process.

The formula now used is as follows:

Take of Alcohol, (s. g. .835,) 1 gal. = 6 lb. 12 oz. av.

Sulphuric acid, (s. g. 1.845) 1 gal. 14 f. 3 = 16 lb. 14 oz. av.

Carbonate of soda, 10 grs.

Distilled water, a sufficient quantity.

To the alcohol, in a suitable vessel, add the sulphuric acid slowly. Stir the mixture and allow it to stand twenty-four hours. Decant the clear liquid into a three gallon retort, excluding all the sediment, and distil it from a sand bath at a temperature between  $318^{\circ}$  and  $330^{\circ}$ , till a black froth arises in the retort, or until the distillation of liquid ceases, and only gaseous products pass through the condenser. Separate the oily stratum from the distillate, and expose it for twelve hours in a shallow capsule. Wash it first with an equal volume of distilled water, then with a solution of the carbonate of soda in a similar proportion of distilled water, and finally with distilled water again. The finished product should measure at least ten fluid drachms, s. g. 1.1.

On mixing the alcohol and acid the mixture becomes heated

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to 225°, and while hot measures 6 f.℥ more than the sum of the ingredients. When cold, however, it measures 15 f.℥ less than when hot, or 9 f.℥ less than the sum of the ingredients. After standing twenty-four hours the mixture should be clear, and of a very pale brown color with a pink tinge, or, if the alcohol is very good, should be as nearly colorless as though the acid had been diluted with so much water. On the other hand, if the alcohol contains much grain oil, the mixture will be of a pink color inclining to purple. The decantation should be very carefully performed, so that all the precipitated sulphate of lead may be excluded, and the retort should be of such a size as to be three-fourths filled. The retort should be fitted with a thermometer (bulb immersed in the mixture) in the tubulure, and should be so placed on the sand bath that all parts of the neck incline toward the condenser. It should be placed in a sand pot, with only about a pint of sand under the bottom to distribute the weight,—for if much sand be used it is difficult to manage the temperature nicely. A large Liebig's condenser should be adapted to the retort beak, and the mixture then heated up as quickly as possible to 300°, when the fire door is opened, and the fire farther damped with a layer of fresh coal. The temperature, however, goes on rising from the heat of the pot and sand till it reaches about 324°, where, by management of the fire door it may be steadily maintained till the charge is finished. The mixture becomes brown as it is heated and boils at 250° with the distillation of an ethereal liquid. In proportion as sulphurous acid gas comes over with the distillate, the mixture becomes of a darker color, and the distillate more yellow, but heavy oil of wine is produced and comes over with the ether before the smell of the gas is noticed. If the temperature rises much above 330° frothing up is very liable to occur at almost any stage of the process, but if maintained, as it can easily be, at 322° to 326° half the charges, at least, may be finished without any frothing at all. This termination is very much to be preferred, for the lifting of a heavy frothing retort with such contents, at such a temperature is attended with much danger. Each charge requires about four hours for its successful management; and two charges can be worked off the same retort in a day. The discharging of so hot a liquid is attended with great risk of breaking the tubulure, so that it

is better to use two retorts, when three charges can be conveniently worked off from one fire in a day.

When a small quantity of water is poured into a frothing retort it causes the distillation of a colorless watery liquid of a most agreeable aromatic odor and taste, quite different from that of oil of wine.

With these proportions the oily stratum of the distillate is almost always on top, because the water that comes over is highly charged with sulphurous acid. With the proportions of the Pharmacopœia, however, it is as often below as above.

When two or more charges are worked off at one making it is economical to collect the oily strata of the distillate in a small retort, and to recover the ether from the whole at a temperature below  $140^{\circ}$ . The oily residue is then thrown into thrice its bulk of water and well stirred. The oil separates at once in colorless (or nearly so) opalescent globules, and falls to the bottom of the vessel nearly free from impurities. The precautionary washing with dilute solution of carbonate of soda, and again with distilled water is, however, advisable and proper. The whole is then thrown into a well moistened filter, from which, when drained, it is drawn into a measure through a small hole made in the bottom of the filter.

These washings are wasteful, and occasion the greater part of the loss in working on the small scale, the water being always left opaque from small particles of oil in suspension. In washing 5 f. 3 of oil, about 8 minims nearly is lost each time, or an aggregate of nearly half a drachm. From the difficulty with which this suspended portion separates from the washings upon long standing, and from the fact that the washings increase the s. g. of the product very much, it is probable that the portion thus lost is mainly light oil of wine or etherole.

When oil of wine is made in quantity, and to be kept, it should be diluted with twice its bulk of alcohol, to protect it from decomposition or change of color, for without this it becomes dark colored, and more impure than before being washed; but how long beyond nine months it will remain unchanged when thus diluted is not yet determined. Upon the scale of this formula the cost of materials, apparatus and fuel, without estimating labor, will not produce heavy oil of wine at less than \$1.60 to

\$1.70 per fluid ounce, instead of 70 or 80 cents, as it should be by the authorities above mentioned.

The great disproportion between the materials and product, under the most favorable circumstances make it most desirable that some economical process should be found for this preparation, and the writer has been long under the impression that by the distillation of anhydrous sulphovinates better results might be had. The few crude trials made in this direction have, however, thus far given no hope of success as far as practical application is concerned.

The attempts to make heavy oil of wine from the residue of a well conducted process for ether, have also, in the writer's hands, always proved abortive, or, at least have yielded too small a product to pay for the fuel and apparatus involved. When the materials for ether are worked to the best advantage the residue yields much light oil of wine, but very little heavy oil of wine, and no method has yet been discovered by which such residue can be utilized in the preparation of heavy oil of wine. When ether is made on the small scale, and over a lamp or fire, the materials are rarely managed to the best advantage. The residue, then, will yield a notable proportion of heavy oil of wine, if the distillation be continued at a higher temperature.

Thus all the efforts made at this Laboratory to produce heavy oil of wine cheaply, have thus far failed signally. But the preparation produced has been of a uniform character and of full medicinal effect and value, and there is no good reason why so valuable a curative agent should not be restored to the medical profession generally. There can be but little doubt that the original character of the compound spirit of ether was based upon an intrinsic curative value, and that such value belonged mainly to the ethereal oil as the anodyne ingredient; and there certainly can be as little doubt now, that for some years past the preparation sold under the name of Hoffman's anodyne has been forcibly dragged along by the materia medica list, supported alone by its unused formula and former character, and that in a few years more it must be dropped entirely or transferred to the class of diffusible stimuli. It remains, therefore, as a question for decision in the medical profession, whether such valuable agents can be sacrificed with impunity to the cupidity of manu-

facturers, taking with them, as they must do, public confidence and support from the profession, and transferring this confidence and support to some enterprising quack, who, as in the case of the compound cathartic pill, preparations of spigelia, quinia, strychnia, &c., through cupidity again, takes it up under a new name, makes it properly and uses it to the irreparable injury of legitimate medicine.

The assertion is probably not strictly true that the curative agency of Hoffman's anodyne belongs to it as found in the market, and not as contemplated in the Pharmacopœia, but rather that its inefficiency is thus fastened upon it, so that every physician who prescribes it loses by it in his value to the community, and transmits the effect to his profession at large. Any proposition, therefore, to dilute the Pharmacopœia down to the manufacturers' standard in this, or any preparation, should be entertained with great caution by all who have faith or experience in an intrinsic value to medicinal preparations. The writer, from being firmly established in the principles truth and efficacy of the theory and practice of the science and art of medicine, and from having had an opportunity of using good medicinal preparations, allows no chance of opposing such propositions to escape him.

In Soubeiran's process for making ether, (see Amer. Jour. Pharm., vol. iv., 3d series, p. 385,) the mixture of ether and alcohol delivered by the middle condenser may be properly used in making the compound spirit of ether. It is usually not far from the proper composition, but requires only the addition of a little alcohol to bring it to the proper s. g. When ether has been made strictly according to the U. S. Pharmacopœia, and is mixed with alcohol in the proportion directed for the compound spirit, the s. g. of the mixture is found to vary between .808 and .814. The rectified residue of the ether process brought up to the s. g. of .812 by the addition of alcohol, is therefore properly available for making the compound spirit of ether from, yet at that stage it is as far from being Hoffman's anodyne as diluted alcohol is from being laudanum, for it contains scarcely a trace of heavy oil of wine, while its light oil of wine has not been considered of anodyne effect.

But if, as in this Laboratory, the whole of the ether residue is utilized in the extraction of tannic acid, the direct mixture of



the ingredients must be resorted to. Whichever course is adopted, however, no collateral product is lost, and the preparations are practically identical.

The officinal compound spirit of ether consists of

Ethereal oil,	3 f.℥,	or 1.56 per cent.
Ether,	8 f.℥,	" 32.81 "
Alcohol,	16 f.℥,	" 65.62 "

The mixing of these ingredients causes a diminution of volume about equal to the measure of the oil, so that the finished preparation has the volumetric composition given, and each fluid drachm contains nearly one minum of the heavy oil of wine.

The weight of 24 f.℥ of it, at 60° is about 8640 grains, hence 1 f.℥ weighs 360 grains. The weight of 3 f.℥ of ethereal oil is 188 grains, hence the proportion of the latter ingredient by weight amounts to 2.17 per cent.

Compound spirit of ether thus made is a colorless bright mobile liquid, of a fruity ethereal odor, of s. g. .812 to .816, and neutral or very slightly acid to litmus paper. It usually gives a very faint cloudiness with solution of chloride of barium after some months keeping.

Five drops = 2m of the compound spirit, well stirred into one pint of water give a distinct oily surface on standing for a moment, and yields the characteristic fruity odor of the oil free from that of the ether and alcohol.

Sixteen drops = 6m, stirred in a like manner into one pint of water visibly affects the transparency of the water.

Sixty drops = 23m renders the water decidedly milky, but not properly opalescent, for the milkiness is of a dull leaden color, and not bluish or pearly as in the appearance generally called opalescent.

Two fluid drachms renders the pint of water so turbid that the bottom of the pint beaker in which the mixture is made can be but just distinctly seen on looking down through the long axis. With four fluid drachms the bottom cannot be seen. The odor and appearance of this mixture are very characteristic. A few minutes after the stirring has ceased the minute globules of oil begin to collect at the bottom of the beaker in the form of a fine, very scanty white precipitate, while the surface is but little more greasy in appearance than when one or two fluid drachms had been stirred in.

If the proportion of the ethereal oil shall have been reduced, and its deficiency supplied by a fixed oil, for purposes of deception, the surface of the mixture will indicate it by the film which collects there in much greater proportion. In this case the simple convenient test, proposed by Prof. Procter, of drawing a slip of paper across the surface, and then drying it with a gentle heat, will expose the fraud if the proportion of water in the mixture is not above one-half. When deception is attempted by means of fixed oils, the milkiness is commonly too great, and of an opaque character not at all like the transparent leaden milkiness attempted to be described above.

One fluid ounce of the compound spirit of ether evaporated to dryness in a water bath, with an excess (say 60 drops of an ordinary test solution) of solution of chloride of barium, yields an insoluble precipitate, which after being washed on a tared filter with two fluid ounces of hot water, and dried at  $212^{\circ}$ , weighs 6.25 grains. This test very conveniently estimates the proportion of heavy oil of wine, for it takes no cognisance of light oil of wine, or any mere hydrocarbon, because its reaction depends upon the conversion into sulphate of baryta, of the characteristic constituent of the heavy oil, namely the elements of sulphuric acid. Moreover, it is a test not easy to circumvent, for it is difficult to combine sulphuric, or even sulphovinic acid practically in this mixture, so as not to be detected by solution of chloride of barium.

These few simple and easy tests are quite sufficient to enable any one to distinguish the officinal preparation, and no one need hesitate in condemning any specimen which will not fulfil their indications.

Specimens purchased from four of the best drug houses in New York city, and representing the three largest, and indeed almost the only manufacturers in the United States, all failed on the very threshold of this testing. These specimens, however, might all have been condemned without the application of a single test except the sense of smell, for a more villainous odor of bad empyreumatic ether, mixed with bad oily alcohol, aggravated in two cases by putrescent bladders used under the corks, could hardly be imagined. One specimen (of conservative prac-

tice) consisted only of bad ether and good alcohol, and was doubtless made where it was sold, for the house that sold it "did not know where it was made."

U. S. Naval Laboratory, New York, March, 1857.

### ON VERATRUM VIRIDE.

By JOSEPH G. RICHARDSON, of Philadelphia.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy.)

The subject of the *Veratrum viride*, or American hellebore, appears to have attracted considerable attention in the pharmaceutical world about twenty years since, when the *Journal of Pharmacy* contained several articles giving the results of experiments on this plant. In the October number for the year 1835 (Vol. I. second series), is an able paper by Dr. Charles Osgood, of Providence, R. I., who seems to have been one of the first to call particular attention to the drug; by preparing a decoction of the root, precipitating by ammonia, boiling this precipitate with animal charcoal, and evaporating the solution, he obtained a white, inodorous and very acrid powder, which he considered to be the active principle of the plant. He states, however, that in drying this substance at about the temperature of 120° F. the greater part of it was volatilized and lost, thereby preventing his intended examination of its properties, and he was subsequently prevented by professional engagements from repeating his experiment. Fortunately, however, these duties did not interfere with his making extended observations on the therapeutical virtues, which he found to be of considerable importance, although differing in some respects from those of the white hellebore; and from this dissimilarity in its effects upon the human system, as well as from the volatility of the principle which he obtained in his first experiment, he concluded that the plant did not contain veratria.

In the ninth volume of the *Journal* a paper by Thomas A. Mitchell is presented, giving a proximate analysis of this plant, in which he mentions having obtained an active principle in the form of a white powder, but in such small amount as to preclude a chemical examination of its properties.

But the most accurate investigation of the *Veratrum viride* as

yet published is that comprised in an inaugural essay by Henry W. Worthington, contained in the tenth volume of the Journal above mentioned; in addition to the other proximate principles he also obtained a white powder, soluble in acids, and powerfully emetic when brought in contact with the lining membrane of the nose, corresponding in these respects with the alkaloid veratria; but the quantity prepared appears to have been, as in the other instances, too small to admit of the application of a series of chemical tests.

These experiments, conflicting as they do in their results with those of Dr. Osgood, appear to require at least a careful repetition in order to be conclusive, and the increasing knowledge of the valuable medical properties of this plant in the treatment of neuralgia and rheumatism, seem to demand a more complete and thorough analysis; that the reply to the question, Does *Veratrum viride* contain veratria? may be no longer a conjectural one. To furnish a decisive answer to this inquiry is the chief object of the present article; and this end is, I think, to be obtained only by a careful application of those chemical tests which distinguish the alkaloid veratria, as many instances occur where bodies precisely similar as far as the senses are competent to decide, differ totally in their chemical reactions.

With this necessarily somewhat prolonged introduction I will now proceed with a detail of the experiments upon the alkaloid, premising that as the other proximate principles are of comparatively little importance, (as determined by former operators,) I shall confine my attention wholly to the supposed veratria. In the first place a series of experiments was undertaken to discover the best method for obtaining the active principle, as follows:

*Experiment 1st.*—A portion of the root properly bruised, was macerated with sufficient water to cover it, for three days, the mass was then transferred to a percolator, and water poured on until the fluid passed nearly tasteless and about six pints of liquid had been obtained. This solution was treated with liquor plumbi subacetatis until no further precipitate was produced, and into the clear liquid separated from the precipitate a stream of sulphuretted hydrogen was passed until sulphuret of lead ceased to be formed, and the liquid had the characteristic odor of the gas;

after boiling to expel the superfluous hydrosulphuric acid, it was evaporated to one-half, magnesia added in excess, and the whole boiled up several times. The liquid was then filtered off, the precipitate boiled with absolute alcohol, and the solution evaporated to dryness, leaving a dark brown resinous looking matter; this was then redissolved in dilute sulphuric acid, and when precipitated by the addition of ammonia was in very minute quantity, and of a reddish color. It had a bitter acrid taste, was colored red by sulphuric acid and yellow by nitric acid.

*Experiment 2d.*—Eight ounces of the bruised root were macerated for two days in a dilute solution of acetic acid; the mass placed in a percolator and water poured on until it no longer became acid; the solution was evaporated to about four fluidounces, precipitated by ammonia in excess, and the liquid filtered off; the precipitate, which was of a dark brown color, weighed after drying ten and a half grains.

*Experiment 3d.*—The aqueous solution of the extract from eight ounces of the root was evaporated to about twenty-four fluidounces, filtered, and precipitated by ammonia in excess; the liquid still containing the precipitate suspended in it was shaken with about four ounces of chloroform; after allowing this mixture to stand a sufficient length of time for the two fluids to separate, the superior layer was decanted, and the chloroformic solution washed until colorless; it was then evaporated to dryness in a water bath, the residue dissolved in dilute sulphuric acid, precipitated by ammonia and re-dissolved by chloroform. By evaporation, this fluid gave about two grains of a whitish powder, which was colored red by sulphuric acid, and acted powerfully as a sternutatory.

*Experiment 4th.*—The solution obtained as before from eight ounces of the root was filtered and precipitated by ammonia; about eight fluidounces of benzole were then added, and the liquids thoroughly mixed by agitation; they were then allowed to remain at rest until two separate layers were formed, when the inferior one was removed by a syphon. The solution in benzole was repeatedly washed until it became colorless, and upon evaporation in a water bath gave a mass which dissolved readily in sulphuric acid, and was precipitated by an alkali of a pure white color.



*Experiment 5th.*—A small quantity of the aqueous solution obtained from the root was treated with bichromate of potassa, which produced a reddish brown precipitate; after the subsidence of this, the supernatant liquid was poured off, and about an ounce of water added for the purpose of washing the residue; it was, however, nearly or quite dissolved in that amount of menstruum.

The first of these experiments being merely a corroboration of Mr. Worthington's process, will require no comment. Thinking that if, as Dr. Osgood supposed, the active principle was a volatile one, a part might be driven off by the heat used in evaporation, the acetic acid employed in the second experiment was added to prevent, by forming a salt with any uncombined alkaloid, such a loss, as well as to assist the extraction from the plant. Third and fourth experiments are based respectively upon the power which chloroform and benzole both have of dissolving the alkaloids; while the fifth was an attempt to apply the principle of a recently published English process for preparing strychnia to the extraction of this substance.

The process by the aid of benzole having given the most satisfactory result, a quantity of the contused root was macerated for sixty hours in dilute sulphuric acid; the dregs were then expressed strongly, stirred up with another portion of water and again expressed; the liquids were filtered without concentration, and precipitated by ammonia, the precipitate filtered off, washed and dissolved in dilute sulphuric acid, and again precipitated by ammonia; the liquid without filtration was then agitated with twenty-four fluidounces of benzole, the two layers allowed to separate, by standing and the benzolic solution washed until colorless; this solution itself divided into two portions, the one clear and limpid, and the other white and opaque, very much resembling thick cream; these were then separately evaporated by the heat of a water bath, when the creamy liquid was found in reality to contain nearly all the valuable matter, the clear portion leaving scarcely any residue. The substance produced by the evaporation of these solutions was of a white color with a slight tinge of red, and dissolved readily in sulphuric acid, with the exception of a small amount of resin; this solution, after being filtered, was precipitated by ammonia, the precipitate washed, and when carefully dried was found to weigh fourteen grains.

The physical properties of this precipitate were as follows: It was white, uncrystallizable and inodorous, but a small portion coming in contact with the lining membrane of the nostril, produced at first a numbness succeeded by the most violent sneezing, which continued for about ten minutes, and left a tingling sensation which lasted for a considerable time. When heated it became discolored, swelled up and was consumed below a red heat; it was nearly insoluble in water, quite soluble in alcohol and partially so in ether. It dissolved readily in sulphuric, nitric and chlorohydric acids, and formed colorless solutions. Through the kindness of a medical friend, I am enabled to state that this substance, administered in a dose of one-tenth of a grain three times a day, afforded very marked relief in a case of facial neuralgia, without producing any unpleasant symptoms.

We now come to the consideration of its chemical properties, and here the field is almost unoccupied: for some unknown reason the reactions of the alkaloid veratria appear to have been but little studied, and while for many of the vegetable principles there are several distinctive tests, for this we have but one, (the red color produced by sulphuric acid,) which is characteristic. Under these circumstances it became necessary, first, to draw a line before describing a parallel, or in other words to examine veratria itself in order to prove that this was identical. The tests applied (with the exception of the two last), were those usually employed in the detection of the other alkaloids, and were as follows:—

<i>On Veratria.</i>	<i>On the alkaloid of Veratrum viride.</i>
Tannin in a dilute solution, a white precipitate.	Tannin in a dilute solution, a white precipitate.
Ammonia in a dilute solution, a white precipitate.	Ammonia in a dilute solution, a white precipitate.
Sulphuric acid, a ruby or crimson* red color.	Sulphuric acid, a ruby red color.
Nitric acid, a clear yellow color.	Nitric acid, a clear yellow color.
Chlorine water on a muriate, no precipitate or coloration.	Chlorine water on a muriate, no precipitate or coloration.

\* This color was of rather a brighter shade than that produced in the other, which difference was probably owing to a minute amount of coloring matter retained by the latter.

Solution of bichloride of mercury, on a muriate, a white precipitate.

Tincture of chloride of iron on a muriate, no precipitate or coloration.

Iodo-hydrargyrate of potassium, a white precipitate.

Dissolved in weak chlorine water, and ammonia added, a white precipitate; a small portion of ferrocyanide of potassium introduced before the ammonia, made no alteration.

Mixed with a large amount of sulphuric acid and a particle of nitrate of potassa added, no additional coloration.

Solution of chloride of gold, a yellow precipitate insoluble in an excess: this precipitate was, however, soluble when boiled, forming a greenish liquid in which caustic potassa gave a purplish black precipitate.

Tincture of iodine, a brownish red precipitate soluble by boiling into a clear red liquid; ammonia added to this while still warm gave a yellow precipitate, gradually changing to white.\*

Solution of bichloride of mercury on a muriate, a white precipitate.

Tincture of chloride of iron on a muriate, no precipitate or coloration.

Iodo-hydrargyrate of potassium, a white precipitate.

Dissolved in weak chlorine water, and ammonia added, a white precipitate; a small portion of ferrocyanide of potassium introduced before the ammonia, made no alteration.

Mixed with a large amount of sulphuric acid and a particle of nitrate of potassa added, no additional coloration.

Solution of chloride of gold, a yellow precipitate insoluble in an excess: this precipitate was, however, soluble when boiled; forming a greenish liquid in which caustic potassa gave a purplish black precipitate.

Tincture of iodine, a brownish red precipitate dissolved on boiling into a clear red liquid; ammonia added to this while still warm, gave a yellow precipitate, gradually changing to white.

These experiments which were carefully made, and where any doubt appeared to exist, several times repeated, show that, not only in its physical characteristics, but also in its chemical reactions, the alkaloid of *veratrum viride* is identical with the veratria of the *veratrum sabadilla*; thus answering, and I confidently believe conclusively, the mooted question, whose solution was my original object.

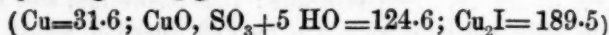
\* The precipitates produced in the solutions with chloride of gold and tincture of iodine appear to be characteristic; they are at least sufficient to distinguish this alkaloid from strychnia, quinia and cinchonia.

## ON THE SOLUBILITY OF IODIDES IN SYRUPUS FERRI IODIDI.

By Jno. M. Maisch.

Recently a syrup of iodide of iron came into my hands which had been obtained of a manufacturing chemist. As it had undergone decomposition and contained free iodine, I was desirous of neutralizing the same so as to have it fit for use. Having put some fragments of iron into it, the syrup was set aside for several weeks, when, on examining it, I was surprised to find the iron covered with copper. From what source was that metal present, and why was it not precipitated by the iodine as iodide of copper, which is considered insoluble? These questions presented themselves, and, in order to solve them, a series of experiments were undertaken with the following result:—

The syrup, which in the above way had been deprived of copper, still contained free iodine. One fluid ounce was mixed with a solution of sulphate of copper, two grains of which had been dissolved in 100 grs. of water; every drop of this solution produced a thick precipitate, which, however, dissolved on being agitated with the syrup, which remained perfectly clear after 16 grains of the solution had been added; the 17th grain produced a slight cloudiness, which was little increased on addition of the 18th grain, the syrup still remaining transparent; but 20 grains caused such a precipitate that the syrup looked very turbid, and had lost all transparency. Thus it will be seen that one fluidounce was capable of decomposing  $\frac{1}{2}$  gr. of sulphate of copper, and holding the formed iodide of copper in solution.  $\frac{1}{2}$  grain of sulphate contains 1-12th gr. of metallic copper corresponding with  $\frac{1}{2}$  gr. of its iodide.



Thirty grains of iron and three grains of copper, both in the state of fine filings, were agitated with eight grains of iodine and the necessary quantity of water. A greyish matter floated in the liquid corresponding in all physical properties with a precipitate of iodide of copper. The liquid was filtered into a vial containing enough sugar to make one ounce of syrup, which was of a greenish unsuspecting appearance, and did not separate any copper on a bright spatula having been left in contact with it

for an hour; the iron wire which had been thrown in, however, was covered with copper after standing twelve hours, and a considerable precipitate of iodide of copper had been thrown down.

Freshly precipitated iodide of copper was put on a filter, and syrup of iodide of iron filtered through it. The filtered liquor on standing till next day had precipitated iodide of copper, and the remaining solution still contained copper which could be thrown down by iron.

A syrup which does not contain free iodine may be agitated with copper turnings without dissolving any of it; but when containing iodine in a free state, it dissolved some copper, which covered the iron that had been afterwards thrown in.

A much larger proportion of iodide of copper could be dissolved in the syrup if it was kept at  $212^{\circ}$  F. One fluidounce of the syrup was put in a water bath heated to  $212^{\circ}$ ; a quantity of a solution containing 2 grs. of sulphate of copper had to be added before a cloudiness was obtained. These two grains correspond with  $1\frac{1}{2}$  grs. of iodide of copper, which, for the greater part was thrown down on cooling.

Most experiments were performed with the neutral syrup, and with another sample that had decomposed on exposure to the air, and contained some free iodine. The results of the solubility of iodide of copper varied slightly in both cases, and the neutral syrup seems to take up rather more of that insoluble compound; the difference though is very slight.

It was curiosity now which induced me to see whether others of the insoluble iodides were taken up by the iron preparation; and I was surprised to find the iodides of lead, silver and mercury easily soluble. The green iodide of mercury turned black and dark green as soon as thrown in the syrup; the red iodide was taken up in very considerable quantities, and after standing several days, the syrup had a voluminous sediment of a dirty blackish yellow iodide, while the supernatant liquid had scarcely a brownish tinge. Here the question arises: how does a reduction take place, and what is the result of it? May not the formation of a soluble double iodide of iron and mercury cause the ready solubility of the red iodide of the metal, which, through the influence of the atmosphere, is decomposed again?



These experiments show us at any rate,

1. That iodide of iron dissolves more or less readily the insoluble iodides of some heavy metals, especially of *copper, lead, silver and mercury.*

2. That the presence of copper during the process of preparing the syrup causes the same to be contaminated with that poisonous metal, although iron may have been in large excess.

3. That iron decomposes all iodide of copper thus dissolved, only after a prolonged contact.

The practical results will be,—

1. To guard against the presence of any metal but iron during the preparation of this officinal syrup.

2. To be able to combine the action of mercury and iron with iodine in a dissolved state. On this, however, some more experiments are needed.

*Philadelphia, March, 1857.*

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REMARKS IN REFERENCE TO THE SPURIOUS WINTER'S  
BARK DESCRIBED IN THE JANUARY NUMBER OF  
THIS JOURNAL.

BY DANIEL HANBURY.

*London, Feb. 14, 1857.*

To the Editor of the American Journal of Pharmacy:—

SIR:—Having perused with some interest the communication of E. S. Wayne in your January number, relative to a spurious *Winter's bark*, recently offered for sale in New York and Philadelphia, I am induced to address you a few remarks upon it, because I am convinced that the conclusion that Mr. Wayne has drawn, is not that at which he would have arrived, if he had possessed authentic specimens of the barks to which he refers.

Discovering that the new *Winter's bark* had been imported from the west coast of South America, Mr. Wayne refers to the description of *Malambo bark* as given in the *Pharmaceutical Journal and Transactions*\* and in other works, and finding a certain coincidence in the recorded physical characters of the

\* Mr. Wayne quotes this periodical under the title of the "*London Journal of Pharmacy.*"

*Malambo* with those he had observed in the new *Winter's bark*, he persuades himself that the two are identical.

In the 9th volume of the same Journal, Mr. Wayne finds some account of *Copalchi bark*, a bitter and aromatic bark allied to *Cascarilla*, and produced by a plant of the same genus, occurring in Central and South America. A certain agreement in the chemical characters of *Malambo* and *Copalchi*, in their reputed medicinal properties and in their place of growth, have induced Mr. Wayne to regard them as identical: and *without having seen either*, he concludes his notice in the following terms:

\* \* \* \* And, to sum up the whole, the evidence is so conclusive to me, that I have no hesitancy in saying that the *Malambo bark* described by Ure, the *Copalchi* by Stark and Pereira as *Corky Copalchi*, and the bark in question are identical."

The evidence for this conclusion, I cannot but consider as wholly insufficient; but the best method by which I can convince you of its untenable nature, is by submitting to you specimens of the barks themselves.

I have accordingly the pleasure to forward specimens of the following:

1. *Malambo bark*, from New Grenada.
2. *Quilled Copalchi bark*.
3. *Corky Copalchi bark* from San Blas, Mexico; vide Stark, in *Pharm. Journ. and Trans.*, vol. ix. p. 463.

With regard to the botanical origin of these barks, I believe there is no doubt that both sorts of *Copalchi* are derived from some species of *Croton*; but of *Malambo*, the source is yet undetermined.

*Winter's bark*,—I mean the bark of *Drimys Winteri*, Forst., with which species are now united the allied species *D. Chilensis*, DeC., *D. Granatensis*, Linn. fil., and *D. Mexicana*, DeC.,\*—does not occur (so far as I know) in European pharmacy. Its place is supplied by another bark (samples of which I send you), of the origin of which nothing positive has been ascertained. This latter bark is regarded by many writers on materia medica as *true Winter's bark*, an opinion of the fallacy of which any one

\* Vide I. D. Hooker's *Botany of the Antarctic Voyage*:—*Flora Antarctica*, part ii, p. 229.; also *Botanical Magazine*, 1854.

may convince himself by consulting authentic specimens of the bark *Drimys Winteri*, such as are to be found in the museums of London and Paris.

I trust you will pardon the freedom with which I have attempted to rectify what I consider to be the incorrect view which your correspondent, Mr. Wayne, has taken, and believe me to be  
Respectfully yours,  
DAN. HANBURY.

NOTE BY THE EDITOR.—After carefully comparing the specimens received from Mr. Hanbury with the bark described by Mr. Wayne as "so-called Winter's Bark," we have arrived at the conclusion—1st. That Mr. Wayne is correct, so far as regards the identity of that bark and the malambo bark of New Grenada; and 2nd. That Mr. Hanbury is correct in believing that the quilled copalchi bark and the corky copalchi bark of Stark are entirely different and distinct from the bark described by Mr. Wayne.

In reference to the first conclusion, so perfectly similar is the specimen sent by Mr. Hanbury with our specimen of the new "winter's bark," that any one might infer them to have been once united. They are identical in color, externally and internally, in texture, both to the naked eye and under a lens, in thickness, in taste, in odor when bruised, and in the contour and number of the warty excrescences dotted over the external surface. Further, their chemical characteristics are the same, as the essay following, upon the same subject, by Mr. Dancy, will give evidence.

In regard to the copalchi barks sent by Mr. Hanbury, no one would mistake them for the malambo who had seen them together. The *quilled copalchi* has considerable analogy to the cascarilla in the color of its epidermis and that of its inner surface, but it is thicker, more regular in its quills, and, in fact, has much the aspect of some of the pale cinchona barks, being half a line thick and the quills four to eight lines in diameter and six inches long. It is less bitter and aromatic than the cascarilla, but exhales an analogous musky odor when burnt slowly.

The *corky copalchi* is in pieces varying from two to five inches long, curved inwards but not quilled, from one to two lines thick, and covered with a light ash-colored epidermis, varying in thickness from extreme thinness to a line or more, where its suberose character is exhibited in irregular wart-like excrescences. Some of the smaller of these resemble somewhat those on the malambo bark in appearance, but differ entirely in their soft corky texture, whilst the inside or proper bark has a darker reddish brown color, and when recently cut somewhat plum-colored. Added to these characters the bark possesses a bitterness so intense that it may be compared to quassia, with less aroma than the preceding. It also gives off a somewhat musky odor in burning.

In reference to the bark sent by Mr. Hanbury as "the Winter's bark of English commerce," and which he says is *not* true Winter's bark, though so regarded by many writers on *Materia Medica*, we may remark, that it is identical in structure, color, taste and chemical characteristics with a bark in the cabinet of the Philadelphia College of Pharmacy, which was presented more than twenty years ago to that institution by M. Guibourt, of Paris, as true winter's bark, yet unlike the winter's bark examined by M. Henry, it contains neither tannin nor sesqui-oxide of iron, and for this reason Professor Thomas was led to doubt its genuineness several years since. This bark is evidently that described by Dr. Wood in the U. S. Dispensatory as the product of *Drimys Winteri*, and from the smoothness of the epidermis and a slight shade of green in the exterior is probably derived from the smooth branches of the tree.

Along with the above sample from Mr. Hanbury, was another labelled "Cortex Winteranus Mexicanus (?*Drimys Winteri*, Forst.)." This bark has a rough epidermis with longitudinal fissures, greyish-brown in some parts and dark reddish brown in spots, about two lines thick, and evidently occurs in large rolled pieces, judging from the fragment sent to us. Its internal color when cut transversely is reddish brown, with spots of a light grey color. When a smooth section is examined with a lens, these lighter spots seem to be a resinous deposit, alternating irregularly in the cortical structure, and the whole bark when thus closely examined has a resinous aspect. To the taste it is exceedingly pungent and less aromatic than the bark last noticed. Its pungency is so intense that it may be compared to black pepper. It contains no tannin, but when macerated in distilled water with a few drops of pure hydrochloric acid, the liquid yields Prussian blue on the addition of ferrocyanuret of potassium. It is to be hoped that Mr. Hanbury, who has access to authentic specimens of the true bark of *Drimys Winteri*, will test them for tannin and sesqui-oxide of iron, and give a description of them as compared with the published accounts.

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#### AN ESSAY ON MALAMBO OR MATIAS BARK.

BY FRANK B. DANCY.

(An Inaugural Essay presented to the Philadelphia College of Pharmacy.)

My attention was first called to this bark by Professor Thomas, a specimen having been presented to him by an importer of drugs of this city, who declared that it was the genuine Winter's bark, and was selling it as such. Professor Thomas, after a slight examination, decided that it was not the Winter's bark, from the circumstance that he was unable to detect in it the presence of either tannin or oxide of iron, two substances stated to be present,

according to the authority of M. Henry. He then suggested it to me as a subject of sufficient interest for examination in order to determine, if possible, the true name and nature of the so-called Winter's bark. In hope of being able to establish this fact, the following investigations were undertaken. The only information I could get from the importer in reference to the bark was, that it was shipped from the port of Maracaybo, and was invoiced Pale Matias; but how he came to regard it as the true Winter's bark, he could not give sufficient explanation, other than that in appearance and aromatic properties it resembled it. How far a party is justifiable in making representations upon such slight evidence is not difficult to determine.

*Description.*

The bark as it presents itself is in pieces of from one to three inches wide, from three to four lines in thickness, and from a few inches to two feet in length, and has a slight inward curve. The inside of the bark is mostly of a dark brown color, while the external side is of a pale yellowish tinge, with a surface somewhat smooth, but where it is studded with a curious tuberculous excrescence. It breaks with a splintery fracture, exhibiting a dull rusty brown color. To the taste it is exceedingly bitter and aromatic. It breaks easily under the pestle, and the powder has a snuffy color and a moist and oily appearance, owing to the large amount of oil the bark contains. The odor of the freshly powdered bark is powerfully aromatic and diffusive.

ANALYSIS.

*Experiment 1st.*—1,000 grains of the finely bruised bark were put into a retort of sufficient capacity, with one pint of water, and allowed to macerate twenty-four hours, after which, heat was applied, and the distillation commenced. The water soon passed over charged with the oil; when the water had nearly all passed over and ceased to have a milky appearance, the process was stopped, and the distillate was set aside for twenty-four hours, so as to allow the complete separation of the oil. With a small glass syringe the oil was then carefully removed from the water. The product was half a fluid drachm of oil of a light yellowish color, possessing the strong aromatic odor of the bark, and completely soluble in alcohol and ether.



*Experiment 2nd.*—To the remaining material in the retort was added half a pint of water, and strongly pressed and filtered. This decoction had an intensely bitter taste, but was almost deprived of the aromatic odor of the bark. To a small portion of the decoction was added a few drops of the muriated tincture of iron, which caused a slight deepening of color, but produced no precipitate even after twenty-four hours standing. To another portion of the decoction was added a warm solution of gelatine, but no change was produced. These two experiments plainly show the absence of tannin. To another portion of the decoction was added a few drops of strong solution of acetate of lead, when a heavy precipitate was thrown down, indicating the presence of gum. A few drops of tincture of iodine were dropped into about an ounce of the decoction, which occasioned a blackish blue color throughout the liquid, and disappeared on being heated. By this was recognized the presence of starch.

*Experiment 3d.*—A cold infusion of an ounce to a pint was made and filtered; to about an ounce of this infusion was added a saturated solution of corrosive sublimate, causing a flocculent precipitate.

Several ounces of the infusion were then boiled in a matrass; this somewhat diminished the clearness of the infusion, and after being set aside for several hours, a slight precipitate had deposited.

*Experiment 4th.*—An alcoholic tincture (2 oz. to 1 pint) had a deep red color and an exceedingly persistent bitter taste. An ounce of this tincture thrown upon some water, a considerable amount of resinous matter deposited, which on being collected and after being kneaded in water, presented all the appearance of resin, and which when applied to the heat of a lamp, instantly fused and ran down in drops, while a portion took fire and burned with much smoke.

*Experiment 5th.*—Two ounces of the coarsely powdered bark were thoroughly exhausted with alcohol of .835, then by evaporating this tincture there was produced 195 grains of extract, of an intensely bitter and aromatic taste. To the powdered bark, after being exhausted with alcohol, and while it was still in the percolator, cold water was added until it passed nearly colorless;

this watery solution upon being evaporated on a water bath, yielded 135 grains of extractive, of a comparatively feeble and bitter taste. This I take to be extractive matter, because the other constituents, gum and albumen, that are soluble in water, exist in the bark in such minute quantities that they could not make bulk of the extract, so that the greater part of the watery extract may be properly considered extractive matter.

*Experiment 6th.*—Two ounces of the finely bruised bark were exhausted with alcohol, and the tincture evaporated, yielding 195 grains of extract having a very bitter taste and an aromatic odor. The bark, after being treated as above, was thoroughly dried and treated with ether. The ethereal tincture had a light sherry wine color, and upon being evaporated produced 85 grains of a light colored semi-fluid extract. This extract has a very bitter taste and a greasy feel. It was partially soluble in alcohol; paper being imbued with it burned brilliantly; a portion of it, after being exposed on a glass plate in a drying closet for a week, still retained its semi-fluid consistence. This I pronounce fixed oil, mixed with a small portion of resin.

10 grains of this extract were boiled with one fluid drachm of alcohol of .835, and decanted from the insoluble portion while hot; on cooling it let drop a precipitate of a flaky appearance. These flakes on being separated were almost completely soluble in cold ether, entirely when the ether was warmed. They are entirely soluble in chloroform, also in olive oil; when applied to the heat on the point of a knife it first fused, then took fire. This substance I concluded to be wax.

*Experiment 7th.*—200 grains of the powdered bark were exhausted with ether and evaporated spontaneously, produced 30 grains of extract, composed principally of volatile oil, resin and fixed oil; had the consistency of a thick oil; its taste is very bitter and acrid, leaving a tingling sensation on the tongue, not unlike that occasioned by pyrethrum. The amount of volatile and fixed oil is remarkably large for a bark.

*Experiment 8th.*—1000 grains of the coarsely powdered bark were incinerated in a crucible, the unconsumed product weighing 140 grains. A strong solution was made from the ashes, with boiling water and filtered. The solution had a very alkaline taste, and effervesced with acids. To a portion of this solution

were added a few drops of a strong solution of tartaric acid with no immediate change; but on allowing it to stand for twenty-four hours beautiful transparent crystals of bitartrate of potash were formed. To another portion of the solution a stream of carbonic acid was passed, it produced a white precipitate. Oxalate of ammonia threw down a precipitate of oxalate of lime.

*Experiment 9th.*—300 grains of the ashes were digested in diluted sulphuric acid and filtered; to this solution was added a strong solution of ferrocyanate of potassa, but no satisfactory indication of iron was given.

*Experiment 10th.*—100 grains of the ashes were treated with diluted muriatic acid until all that was soluble was taken up. The solution was again filtered and a saturated solution of carbonate of ammonia was added in excess. The solution was again filtered to separate the carbonate of lime. The solution was then boiled some time, but it retained its transparency. After it had cooled down, a solution of phosphate of soda was then added, which caused a considerable precipitate of phosphate of magnesia.

The residue that remained in the filter after treating the ashes with muriatic acid amounted to 22 grains. This was boiled with liquor potass and filtered. Muriatic acid was then added to excess. Solution was then evaporated in a capsule to dryness, and the heat was raised to about 600° F. After it had cooled, the mass was dissolved in water and a whitish flocculent matter settled to the bottom. This I take to be silica.

*Experiment 11th.*—Twenty grains of hydro-alcoholic extract were rubbed with a few drops of liquor potassa, when an amount of ammonia was given off quite perceptible to the smell. Before I had completed the above experiment, my attention was called to an article by Dr. Ure (*Pharm. Jour.*) upon a bark he supposed to be the malambo matias. The result of his experiments agree so closely with those I had made that I am forced to believe that the barks are identical.

The bark contains, 1, a volatile oil; 2, gum; 3, starch; 4, albumen; 5, resin; 6, extractive matter; 7, fixed oil; 8, wax; 9, potash; 10, lime; 11, magnesia; 12, silica.

Dr. Ure, in speaking of the so-called malambo bark, says it

is from three to four lines thick, brittle, though somewhat fibrous; emitting, when freshly bruised, an aromatic odor not unlike that of the *acorus calamus*; it is of a brown hue, covered with an ash colored tuberculous epidermis; it possesses a bitter, pungent taste. Heated along with hydrate of potash free ammonia is disengaged, indicating the presence of an azotized principle. With water it forms an agreeable bitter infusion. With alcohol a powerful bitter tincture. Ether extracts from it a volatile oil and resin. It is without astringency. It appears to coincide, as suggested by Mr. Guibourt, both in regard to physical and sensible qualities, with *malambo*, the Indian name for the bark of a tree which grows in New Grenada, and which is held in high esteem by the natives as a febrifuge and stomachic. *Malambo* bark was analyzed by M. Cadet de Gassicourt about twenty-eight years ago. (*Jour. de Pharm.* tom. ii. p. 172.) Subsequently by M. Vauquelin, who ascertained the presence of three distinct substances, namely: an aromatic volatile oil; 2, a very bitter resin; 3, an extract soluble in water, which yielded ammonia when heated with caustic potash. (*Annales de Chem.* tom xvi. p. 113). It afforded no tannin, scarcely a trace of gallic acid and none of the alkaloids of cinchona. It is stated that in countries where this tree is indigenous incisions are made in the bark, and there exudes an aromatic oil which sinks in water. Most of the authors believe it to be the produce of a species of *drimys*, but Bonpland regards it as a quassia (*Merat de Lens, Dictionnaire de Mat. Med.* tom. iv. p. 99).

This, however, is impossible, since none of the quassia tribe yet discovered are possessed of aroma. The above Columbian bark has frequently been administered by me as a substitute for cinchona with good effect. It offers the useful combination of a tonic and an aromatic, and seems to exercise its influence on the principle last laid down by Professor Shultz with regard to other therapeutic agents of the same class, namely: of increasing the flow of bile, whereby digestion is perfected and healthy blood formed. In scrofulous ophthalmia, after removing flocculent accumulations from the bowels, I have known an infusion made with ʒij of the bark to Oj of water, cause a speedy and complete removal of the inflammation and morbid sensibility of the eyes. The dose of the infusion just mentioned is from one to two

ounces, repeated twice or three times in the course of the day. It may in some instances be advantageously conjoined with salts of iron or of mercury, with both of which it is compatible. The addition of a little syrup of orange peel and compound tincture of cardamom forms a draught by no means disagreeable.

*Conclusion.*

This article furnishes a key in part to the subject under consideration, though it is not quite so conclusive as it could be desired. That the bark is the same as that which Dr. Ure speaks of does not admit of a doubt, but whether it is positively the *malambo matias* or not remains to be determined, but yet we have every reason to believe that it is so. Owing to the fact that no botanical history of the tree furnishing this bark could be found anywhere, which I regret exceedingly, the true name of the bark could not be satisfactorily settled. It is evident from these sensible properties that it possesses valuable medicinal qualities, combining, as it does, the agreeable aromatic with the powerful bitter properties. It is to be hoped that physicians and others having it in their power, will take hold of this bark and test its remedial powers, and give it such a place in the *materia medica* as its merits may justify.

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REMARKS ON CHLORINE WATER.

By DR. EDWARD STIERON, Tarentum, Alleghany County, Penna.

The editors of the *Dispensatory of the United States* (10th edition, Philadelphia, 1854), have given two different methods of preparing chlorine water, one is called the Dublin, the other the Edinburgh method.

According to the Dublin method, chlorine gas is expelled from a mixture of peroxide of manganese and muriatic acid, and the gas absorbed by a certain quantity of distilled water; according to the Edinburgh method, certain quantities of chloride of sodium, of red oxide of lead, of sulphuric acid, and of water are put in a bottle with a glass stopper, and occasionally shaken. Then, after the red color shall have changed almost white, the insoluble matter will be allowed to subside before using the liquid.

By the Dublin method, the true and pure solution of chlo-



rine will not only be obtained, but the preparation will succeed more quickly than by the Edinburgh method, although the conscientious pharmacopolist may be put to the trifling expense of a gas-bottle and two suitable glass tubes; the apparatus itself, with a little care, may be used for a long time.

The preparation of the chlorine water by the other, or Edinburgh method, is under all circumstances objectionable, notwithstanding the language of the Dispensatory, page 894,—“containing a little sulphate of soda, which does not interfere with its medicinal properties;” it contains this solution of chlorine with the sulphate, and other things which it ought not to contain; and in its internal or external application, effects may be produced very different from those looked for by the physician, who thinks he is using a pure article instead of a very impure one.

The chlorine water strictly made according to the Edinburgh formula, contains *no lead*, and according to repeated experiments recently made by me on various samples of the article obtained from a drug store, contains also free sulphuric acid, copper, *etc., etc.* The red oxide of lead always contains copper in varying quantities, and which may be seen, page 574 of the United States Dispensatory, under the article “Plumbi Oxidum Rubrum;” it even constitutes a material portion of the chlorine water prepared by this objectionable method. I have found in one ounce of this solution of chlorine:—

9.0920 grains of NaO,  $\text{SO}_3 + 11.4637 \text{ HO} = 20.5557$  grains of  $\text{NaO}, \text{SO}_3 + 10 \text{ HO}$ ,  
 5.8429 “  $\text{SO}_3 =$  to 7.688  $\text{SO}_3 + \text{HO}$  at 1.842 sp. gr.  $\left\{ \begin{array}{l} \text{Sulphuric acid of} \\ \text{commerce.} \end{array} \right.$

0.0200 of a grain of NaCl,

0.342 to 0.443 of a gr. of CuO  $\text{SO}_3 =$  to from 0.563 to 0.695 of a gr.  $\text{CuOSO}_3 + 5 \text{ HO}$ ,

Traces of sulphate, of peroxide of iron, of chloride of iron, of chloride of copper, of sulphate of lime and of sulphate of magnesia. The two last derived from the impurities of the muriate of soda, that is, from the chloride of sodium and chloride of magnesium, contained in it.

The presence of copper can be easily detected by evaporating chlorine water a little in a dish of glass or porcelain, and then adding a solution of any caustic alkali as long as the liquid reacts still a little acid, and then by putting into it a polished iron rod, on which the copper will be precipitated in a metallic state; or a little more caustic ammonia may be added to the

chlorine water, over and above what may be necessary to precipitate the oxide of iron, *etc.*, then the liquid being filtered, and then slowly heated to expel the excess of ammonia, or neutralized by adding nitric acid. By adding a solution of ferrocyanate of potassa, a red precipitate will be formed, or at least it will show a red color, according to the greater or less quantity of copper contained in the liquid. If it be desired to ascertain the exact quantity of copper, then sulphuretted hydrogen gas must be passed through the chlorine water, the sulphuret of copper thus formed must be decomposed and oxidized by using nitro-muriatic acid, and the copper is to be precipitated from the filtered solution by caustic potassa. The oxide of copper now obtained, must beedulcorated, exsiccated, ignited and weighed.

According to my judgment, the Edinburgh formula for making chlorine water should be expunged from the Dispensatory of the United States, and apothecaries should only be allowed to prepare the article according to the Dublin method. *Sapienti sat!*

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#### ON THE ACTION OF IODIDE OF STARCH ON VARIOUS SALTS.

By M. F. PISANI.

Iodide of starch poured into solutions of various salts, is decolorized in certain cases, whereas in others its blue color is unaffected. Thus, the salts of silver immediately decolor, iodide of starch, but those of lead and copper have no action on it. The metals, besides silver, which produce this decoloration are—mercury, tin (stannous salts,) antimony (the chlorides,) arsenic (arsenious acid and chloride,  $\text{As Cl}^3$ ), gold (perchloride,) iron (ferruginous salts,) and manganese (manganic salts.)

Iodide of starch enables us at once to distinguish the mercurous from the mercuric salts; for with the mercurous salts, there is decoloration, at the same time that the yellow iodide is precipitated, whereas with the mercuric salts there is decoloration without the formation of any precipitate.

Stannous and stannic salts, likewise behave quite differently with this reagent. Thus, the first alone have the property of causing it to lose its color. Arsenious acid and its correspond-

ing chloride, likewise decolor iodide of starch. With arsenic acid there is no decoloration.

If we bring to the maximum of oxidation by nitric acid the metals which decolor iodide of starch, silver and mercury are the only two which retain that property. This decoloring action of these two metals on iodide of starch is easily explained in another manner, their great affinity for iodine. Vauquelin observed, that in triturating nitrate of mercury with iodine, iodide of mercury was formed, and probably also iodate. It is only necessary to place a crystal of iodine in a solution of mercuric nitrate to see the red iodide form on its surface, and the same time a still lighter white powder appears, which is the iodate. I have observed the same reaction with iodine and nitrate of silver; when put in contact with this salt, the iodine is quickly surrounded with a yellow aureola of iodide, the quantity of which gradually increases.

M. Deville has shown how strong an affinity exists between silver and iodine, since under the action of hydriodic acid the chloride of silver itself is decomposed. But the most curious thing is, that iodide of starch agitated with chloride of silver, very readily yields its iodine to it, and transforms it into iodide. Chlorine is found in the filtered liquor, and the blue color has disappeared.

Iodide of starch is the most sensitive reagent for ascertaining the presence of silver, should no mercury be present. Thus, in 100 c. c. of liquor containing  $\frac{1}{10}$ th of a milligramme of silver, a cubic demicentimetre of iodide of starch produces decoloration, whereas the same quantity produces perceptible coloration in 100 c. c. of pure water. In a smaller volume of liquor, we can recognise the presence of a  $\frac{2}{100}$  of a milligramme of silver with iodide of starch.

We can instantly discover the presence of silver in commercial lead, by dissolving it in nitric acid, letting the liquor cool and then pouring in a little iodide of starch. The excess of acid must be previously saturated with carbonate of lime, so that it should have no action on the iodine. A similar quantity of lead, containing no silver, becomes perceptibly colored by the addition of a few drops of this solution.

In these experiments I have used the soluble iodide of starch, prepared by Dr. Quesneville.—*Chemist, from Comptes Rendus.*

## THE GUMS AND RESINS OF COMMERCE.

By P. L. SIMMONDS.

(Continued from page 142.)

MASTIC is derived from the *Pistacia lentiscus*, a very common shrub in various parts of Northern Africa, where it is sought out for its resinous produce.

In the island of Chios, where the tree is cultivated for the sake of the resin as carefully as the vine, it is customary to make small incisions in the trunk and chief branches, about the end of July. From these clefts the sap, which gradually thickens, exudes; it hangs in larger or smaller drops, and when it is very abundant, trickles on the ground and dries there. It is detached from the tree by means of a very sharp instrument; often it is caught upon cloths spread under the trees, in order to prevent any soli being derived by contact with the ground.

The largest consumption of mastic is in the East, where it is universally chewed, and thence derives its name. It is asserted to be effectual in whitening the teeth, strengthening the gums, and sweetening the breath. Mastic is also used in the preparation of the finer varnishes for pictures, &c. Owing to a recent more extensive demand for France and deficient supplies, this gum has run up in price considerably, being now vended at about 1s. 6d. the ounce. As much as 1500 cwt. was formerly annually exported from Chios. Dissolved in alcohol, mastic forms a very useful cement. It is obtained in Brazil, from the *Pistacia Atlantica*, and in Beloochistan and Afghanistan from other varieties, *P. Kinjuh* and *P. Cabulica*.

Most of the Eucalyptus genus in Australia furnish gum in abundance, particularly the red, spotted, and white gum, the iron and stringy bark and other trees. It exudes both spontaneously and in larger quantities when incisions have been made in the trunk, more particularly after rain. It is seen in masses upon the trunk, but its particles have so little tenacity, that when in a concrete form any attempt to detach them in one entire lump fails, and it crumbles immediately into innumerable fragments.

This gum resin has a strong astringent quality, and is one of the varieties of the kino of commerce.

At first it is of the consistence of very thick syrup, and immediately after rain may be seen flowing from an incision or cleft

in the tree very abundantly, being then of a beautiful bright red color, becoming of a dark shining red, and hardening by exposure to the air.

The *Angophora lanceolata*, or apple tree of the colonists, (a genus allied to that of *Eucalyptus*,) also yields a dark and astringent gum from its trunk and branches. A gum as fine as amber exudes from the stem of a *Macra Zamia* in Australia.

The KOWRIE GUM of commerce is the produce of *Dammara Australis*. For a long time it was much neglected, and the shipments made to this market did not repay the cost of its collection in the colony. The Americans, however, purchased it readily at first for £16 to £20 the ton, and it was used by them as a substitute for copal in the manufacture of varnish. From 14 to 17 tons come in annually to Liverpool, and within the last year or two it has been in greater favor in the London market, and larger supplies are coming forward. In 1851, 16½ tons were shipped from the port of Auckland, and in 1852, 107½ tons. This resin may be obtained in any quantity in the northern districts of New Zealand, ranging from twenty miles south of Auckland to the North Cape.

The Kowrie pine grows to a gigantic size. The gum resin exudes from it, and bears some resemblance to the dripping of a wax candle in the wind. It is now in demand for the manufacture of varnish and other purposes, and it is found in masses of several pounds weight. The Kowrie gum, though clearly the produce of this tree, is dug from the ground in quarters where no traces of trees now exist. The gum-diggers probe the soil with long iron spikes, and extract the gum thus indicated from generally a couple of feet below the surface. These pieces of gum are probably the relics of primeval forests, which have disappeared long ago. The resin streams copiously from the stumps of the trees which have been felled, covering them with an appearance like wax, and hardening in the air.

BOTANY BAY GUM is a yellow resinous exudation from the *Xanthorrhœa hastilis*, and other species of the grass tree of Australia, which were generically named by Swartz, from this peculiarity. It is darker than gamboge, and less uniform in appearance, and not entirely soluble in alcohol. It has been used medicinally, to unite the edges of wounds, and in the form



of tincture, with opium, in dysentery and diarrhoea, and also forms the base of a cement. This resin contains benzoic and cinnamic acid. Another species of the same family, *X. Australis*, furnishes a more brittle resin, of a brilliant dark red color, known in the colony as "black boy gum." These resins are spoken highly of as useful for varnish, and as substitutes for shellac. The grass tree is one great characteristic of the scenery and of the vegetation of Australia. It puts one in mind of a tall black native, with a spear in his hand, ornamented with a tuft of rushes. On the spear is found an excellent, clear, transparent gum, and from the lower part of the tree oozes a black gum which makes a powerful cement, used by the natives for fastening stone heads on their hammers. This gum resin may be obtained in inexhaustible quantities.

Capt. Wray, R. E., submitted a report to the local authorities of Western Australia, last year, on the manufacture of illuminating gas from the Xanthorrhoea, at one-third the expense of lighting with oil or candles.

The plant grows in abundance all over the colony, and is composed of a core of hard fibry pith, about half of its whole diameter, round which there is a layer of resin, varying from half to one inch or more in thickness, which forms the connexion between the leaves and the core. Between these leaves, and also adhering to and covering them, is a considerable quantity of resin; resin also exudes in large lumps from the sides of the plant.

*Method of obtaining the material.*—In the first instance, the leaves and resin were separated from the core, by breaking up the plant with an axe, and sifting the resin from the leaves, but it was found by experience that as much gas was obtained from an equal weight of the leaves and resin together, as from the resin alone. The quantity of resin obtained from an average sized "black boy" was about 45 lbs. weight. This was collected easily, at the rate of 5 lbs. per hour, by a person having for his tools an axe and a sieve.

Should the resin be collected for export, I am satisfied that by a proper arrangement of crushers and sieves, a laborer, at 4s. per diem, (the colony rate,) could collect at least one hundred weight per diem, enabling the resin to be brought to market, at

Freemantle, for £4 per ton, the ton weight measuring forty-five cubic feet when pressed. The quantity of gas obtained by Capt. Wray's experiments, was at least four cubic feet to the pound of resin and leaves, but much more might be obtained by a more complete apparatus.

A cart load of the plants, 8 in number, weighed 1048 pounds. When the core was removed the leaves and resin weighed 628 pounds. This core is very good fuel when mixed with other wood. The specific gravity of the gas is 888. The products of the distillation are gas, tar, and coke. The tar obtained was about 1 quart for every 10 lbs., and this, when re-distilled, gave 8 per cent. fluid ounces of naphtha, and 20 per cent. of a sweet spirituous non-inflammable liquor. The coke remaining was about  $\frac{1}{4}$  of the original weight, and with other fuel burns well. The coke of the leaf has a bright shining appearance, and when ground with oil is a very good substitute for lamp black in paint. The gas has a smell somewhat similar to coal gas, not nearly so offensive, but sufficiently strong to make any escape immediately perceptible. Its illuminating power appears to be very superior to coal gas, and its light very white.

Captain Wray is of opinion that when the production of the gas from the resin of the *Xanthorrhoea* is conducted with suitable apparatus, the cost per annum will be materially reduced, so far indeed that the resin may become a large and profitable export from the colony to places which are not lit at all, or lit with oil. Among these may be enumerated Singapore, Hong Kong, Melbourne, and Adelaide.

The supply is, I may say, unlimited, and even were it is not so, it would be advantageous to get rid of the plant from all the land fit for cultivation. Should, however, it be found that the plant was likely to get scarce, the resin might be obtained by tapping.

The gum resin of the New Zealand flax (*Phormium tenax*) is admirably adapted for sealing letters, and when remittances are enclosed, is frequently made use of by the colonists for that purpose. It is insoluble either in water or spirit, and so thoroughly penetrates the envelope as to become part and parcel of it, nor is it possible to get at the contents of a letter so sealed.

One of the gum trees of Popayan in Colombia yields a resin so

remarkably tenacious, that when used to varnish ornamental work it resists the application of boiling water, or even acids, for which reason tables, cabinets, &c., made by the Indians, and lacquered with it, are highly valued at Quito.

At Copiapo a resinous gum is obtained from the branches and berries of a shrub, with a leaf like the rosemary. It is made into cakes of two feet long, by one foot thick, and is used for paying of ships, glazing the earthen jars of the country, &c.—(*Frezier's Voyage.*)

Thenethea, the produce of an undescribed plant, is used by the Burmese as a coating for umbrellas and as a varnish.

The resins of Algiers are those from the terebinthe cedar, juniper, *Pinus halepensis*, of which there are large forests, *Thuya articulata*, and lentiscus, alk or lek, sanderic, mastic, and pitch and tar.

In 1853, France imported over 3 millions kilogrammes of resinous substances, valued at 1,844,337 francs.

SANDARAC is obtained from the *Callitris quadrivalvis*, Rich., the *Thuya articulata*, Whal. This tree furnishes the highly prized citrus wood of the ancient Romans; and the Thuya wood of Algeria has recently again come into high repute among the French cabinet-makers. Experiments for cultivating it on a large scale are now being carried out in the French African provinces.

It should be remarked that under the generic name of Thuya, various coniferous trees furnishing resin are confounded in Algeria. Sandarac is used in the preparation of varnish, and also for making pounce.

At the Paris Exhibition a light and transparent hard resin, from Coorg, was shown, of which I have a specimen on the table. It is said to be soluble in spirit, and suited for coach varnish, but Mr. Wallis does not speak well of it. The piney varnish of the *Vateria Indica*, is a kind of dammer, which is too soft for general purposes. An Assam resin, unnamed, is also a species of dammer, on which spirits of wine has little or no action.

The Gaub tree resin from Beerpoor is a very dark amber color, which melts lighter in color by heat, and mixes with oil. There is also a more transparent lighter variety shown from Calcutta.

According to my correspondent, Mr. Ondaatje, a black resin

is produced by a tree growing in the more barren parts of the district of Ceylon, in which he resides (Badulla), and belonging to the Anacardiaceæ, a tribe of plants which abounds in black resinous juice, whence the black varnishes used in China and India are obtained. It would seem to be the *Semecarpus obovatum*. From natural fissures of the bark, there runs out a clammy juice, which, at first white, becomes afterwards black by exposure to the sun's rays, hardening into masses of different sizes with pieces adhering. The resin is hard, breaks with a smooth shining fracture, burns with a bright flame, melts in fire, and is soluble in turpentine, insoluble in water, and adheres strongly to wood and metal. It is free from acidity. It forms a superior black varnish when added to a saturated solution of vateria resin, or East Indian copal, in oil of turpentine.

Two specimens of Ceylon resin, which I have here from the Paris collection, are merely species of dammer.—*Jour. Frank. Institute, from Jour. Society of Arts, London, 1855.*

(To be continued.)

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#### ON WILD SENNA.

By DR. CARL MARTIUS.

At the meeting of Apothecaries held at Munich, Dr. Walz exhibited, under the name of *Wild Senna*, some leaves which had come into his possession, and with which none of those present was acquainted.\* At the meeting of Naturalists at Vienna, these leaves were also exhibited by Dr. Walz, as *Folia Coluteæ*. More recently I have received the August number of the *Neues Jahrbuch für Pharmacie*, in which, at page 87, a notice on the subject occurs from the pen of the same *savant*. His examination into the origin of these leaves led to no definitive conclusion. The supposition that *Coriaria myrtifolia* might afford them, was disproved by a comparison with that plant as growing in the Botanical Garden at Heidelberg,—although some of their physical characters, such as smell and taste, seemed to favor such an opinion. The question was not that of the *adulteration* of Senna

\* Augshurger Allgem. Zeit. Beilage, v. 5, Aug.—Archiv d. Pharmacie, October, p. 100.

with broken Coriaria leaves, as noticed by Peschier,\* but of a substance which of late is brought as *Wild Senna* from France to Germany for a secret technical purpose, *tanning*, as it is supposed, and which by chance might give rise to errors and adulteration.

About this time my father, Dr. Theodor W. C. Martius, obtained a small sample of this *Wild Senna*, which was designated *Folia Coluteæ*. The coriaceous, smooth, dull-green leaves have a peculiar aromatic smell, reminding one of fresh Willow Bark, and an astringent, very bitter taste; they are mixed with mature and immature flowering heads, and with pieces of stick. Broken acorn-shells, single leaves of *Pistacia lentiscus* L. and of *Rosmarinus Hispanicus* L., occur also as admixtures. The leaves of this *Wild Senna* vary in size and form. The smallest are but a few lines long, and at broadest but 2 lines; the middle-sized are about 6 lines long and from 3 to 4 broad; the largest seldom exceed 10 lines in length by 4 lines in breadth. The leaves are entire; some obovatelanceolate, some lanceolate, and some lanceolate-cuneate, narrowed at the petiole, and terminated with a point or *mucro*. This *mucro*, a continuation of the mid-rib, is most evident in the lanceolate leaves—least so, and apparently often wanting, in the oval leaves. Together with these three forms, there often occur trident-pointed leaves 6 to 8 lines long, and 2½ to 4 lines broad. The epidermis is firm and thick; the mid-rib visible on both sides (more clearly on the under), and evidently protracted into a point; the lateral veins are three in number, and indistinct. On the surface viewed with a lens numerous white points (*Spaltöffnungen*), which Kosteletzky† and others appear to have taken for glands, are perceptible. The phyllaries of the flower-head are delicate, scarious, brown, ovate, standing around the grey, hairy calyx; the stalk is angular and striated, and with axillary glands. This description applies exactly to the leaves of *Globularia alypum* Linn., whose employment for the adulteration of Senna Leaves, improbable as it appears, has yet frequently occurred, as has been stated by my father in his *Pharmacognosie*, p. 161.

*Globularia alypum* Linn., (*Globulaire Turpith*, Boulette,

\* Trommsdorff Journal, 1828. Bd. 16, p. 57 and 64.

† Allgemeine medizinisch-Pharmaceutische Flora. Bd. 3, p. 873.



*Turpith blanc, Senna of provence*, called by the Spanish *Segulada*, and by the Greeks of Zante  $\Sigma\alpha\eta$ ) belongs to the Linnean class *Tetrandria*, order *Monogynia*, and the natural family *Globularia* of De Candolle. It occurs in the region of the Mediterranean as a perennial shrub of from 1 to 2 feet in height. After a comparison with a botanical specimen in the herbarium of Professor Schnitzlein, my honored tutor, who on this occasion assisted me with his usual kindness, I found that the smaller of the leaves which I have described, were attached to the stalks and short twigs of the lower part of the shrub, while the tridentate larger leaves are those of the flowering shoots.

The *Globularia* was known in the middle ages as a purgative, and was, as Geiger states, introduced into medicine under the idea of it being the " $\lambda\alpha\upsilon\pi\tau\omicron\varsigma$ " of Dioscorides, a plant whose fruit was anciently used as a purgative. Lobel, Dalechamp, and Bauhin regarded the *Globularia* as so violent a remedy, that they termed it *Frutex terribilis*. Clusius figures it in his *Historia* under the name *Hippoglossum Valentinum*, and states besides, that in Spain it is called *Coronilla de Frayles*, i. e. *Coronula fratrum sive monachorum*. Clusius, Garidel, and especially later writers, as Nissole (1712) and Ramel (1784) have endeavored to prove its harmlessness as a simple purgative, and Ramel has even lauded it as a febrifuge: nevertheless, both De Candolle and Gilibert (1806) pronounce it a violent drastic. Loiseleur-Deslongchamps, however, after a trial of the leaves upon twenty four patients, came to the conclusion that the remedy was a mild evacuant, preferable even to Senna, since it had not the repulsive smell and taste of that drug; it acted less violently, and less frequently occasioned griping. The doses given were from 48 to 100 grains in decoction.

In the *Dictionnaire Universel de Matière Médicale* Mérat and De Lens,\* *Coronilla emerus* L. is given as the origin of *Sené Sauvage*, as well as of the leaves known as *Sené Bâtard*, or *Faux Baguenaudier*. That the leaves which I received were neither those of *Coronilla* nor of *Colutea*, it is needless further to insist upon. It shows, however, that there are two kinds of *Sené Sauvage*, or *Wild Senna*, viz., the leaves of *Coronilla*

\* Tome vi., p. 387.

*emerus* L., known in France, and those of *Globularia alypum*, occurring in Germany. Whether our drug, which there is reason to think may be from the same source as that of Dr. Walz, is really identical with his, will soon be determined.

A chemical examination, I regret to say, could be but very superficially performed, owing to my time being previously engaged with other chemical researches. The brown decoction, however, had a strong acid reaction, and not disagreeable odor of Willow Bark, and an intensely bitter quinine-like taste. Solution of baryta and acetate of lead precipitated a yellowish coloring matter, which appeared of the same nature as that found in Rhubarb and in *Rhamnus frangula*. The decoction also contained gallic and tannic acids, besides some indifferent extractive matter.

It was remarkable, that after two extractions with water, the leaves became completely black. In conclusion, I may express the hope that Dr. Walz may, by a chemical analysis and the isolation of the crystallizable bitter substance which he has discovered, succeed in completing our acquaintance with this so-called *Wild Senna*.—*London Pharm. Jour.*, February, 1857.

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#### ON QUINIDINE.

By J E. DE VRY, Ph. D., Rotterdam,

Honorary Member of the Pharmaceutical Society of Great Britain.

In the year 1853, Pasteur found that the substance called *Quinidine* was a mixture of two crystallizable alkaloids, each of which had a different rotatory power when observed in the polarizing apparatus.

The greater part of the mixture was lævogyre, and the crystals were not altered in the air. With chlorine and *liquor ammoniæ* no green coloration was observed. To this part of the mixture, Pasteur gave the name of *Cinchonidine*.

The smaller part of the mixture was *quinidine*; it was dextrogyre and isomeric with quinine. The crystals were efflorescent in dry air and very soon became opaque. With chlorine and *Liquor ammoniæ* they showed the same green color as does quinine when similarly treated.

Although the mixture which Pasteur examined, consisted of

*cinchonidine* and *quinidine*, my own observations have shown me that the greater part of the so-called *quinidine* met with in trade has been, until recently, nothing else than *cinchonidine* containing more or less *quinine*. Thus, for instance, in the Paris Exhibition of 1855, there were several samples of so-called *quinidine*, and of its compounds, but I found them to be all mainly *cinchonidine*.

I am indebted to Mr. John Eliot Howard for having first supplied me with genuine *quinidine*, perfectly pure: soon after I had become acquainted with its properties, my friend M. Delondre also sent me several samples of true *quinidine*, in a state of greater or less purity. The *quinidine* of Mr. Howard was so pure, that I found the same rotatory power as Pasteur, viz.  $250^{\circ}$ .

Although I am still occupied with the investigation of *quinidine* and the other *cinchona*-alkaloids, which investigation is not yet completed, I will not delay making known one property of *quinidine* by which it differs widely from the other three *cinchona*-alkaloids, because the knowledge of this property may be useful for the successful separation of *quinidine* from its cognate alkaloids.

*Quinidine* forms with hydriodic acid a salt which is very difficultly soluble. One part of *neutral* hydriodate of *quinidine* requires 1250 parts of water at  $60^{\circ}$  F. for its solution. The *acid* hydriodate is much more soluble, for one part is dissolved by 90 parts of water at  $60^{\circ}$  F. By this difficult solubility of its *neutral* hydriodate, the presence of *quinidine* can easily be detected. I was enabled by this reaction, together with the observation by polarized light, to prove undoubtedly that the so-called  $\beta$  *Quinine* of Van Heyningen is nothing else than *quinidine*. A few grains of  $\beta$  *Quinine* prepared by the late M. Van Heyningen himself, enabled me to prove this fact.

Although the sulphate of *quinidine* is sparingly soluble in cold water, the solution is nevertheless very strongly precipitated by a solution of iodide of potassium. I have no doubt that the manufacturers of *quinine* will be able by using this reaction, to find *quinidine* in many specimens of the so-called *quinoidine* or *amorphous quinine*, or, at least, in the mother-liquors obtained

in the preparation of sulphate of quinine.\* In the hands of the scientific manufacturer, such as Mr. Howard, it may serve for the discovery of the barks which contain quinidine. If a bark contains quinidine, a tincture made with strong alcohol, will form crystals of hydriodate of quinidine upon the addition of a few drops of hydriodic acid and stirring the liquid with a glass rod. If quinidine is present, small crystals will separate, either immediately or after some hours, wherever the rod shall have rubbed against the glass.—*London Pharm. Jour.*, Feb. 1857.

## NOTE ON THE COLCHICUM AUTUMNALE.

By L. OBERLIN.

In 1820, after the chemical examination of several plants of the family *Colchicaceæ*, MM. Pelletier and Caventou† assimilated the principle found in the *Colchicum autumnale* to that discovered by them in other plants of this family, and indicated the presence of veratrine in this plant.

In 1833, MM. Hess and Geiger‡ pointed out the difference which separates the active principle of the *Colchicum* from that contained in White Hellebore and Sabadilla, and described the physical and chemical characters of the alkali, which they called colchicine. I have resumed this investigation; but although I have carefully followed the process of extraction which they state they employed, I have not obtained a crystallizable principle, even by trying all the solvents to facilitate crystallization, and two chemists who have repeated the experiment at my request have arrived at the same result as myself. The following are the results of my researches upon this uncrystallizable product, obtained by the process of MM. Hess and Geiger.

The aqueous solution of colchicine, acidified by sulphuric or muriatic acid, acquires an intense yellow color when it is brought to a certain state of concentration on the sand-bath; it gives a

\* This supposition has since been proved by the examination of quinoidine from the manufactory of Mr. Zimmer, from which I obtained 23 per cent. of hydriodate of quinidine.

† *Ann. de Phys. et de Chim.*, xiv.

‡ *Handwörterbuch der reinen und angewandten Chemie*, ii. p. 330.

yellowish-white precipitate with water; this precipitate, when well washed and freed from the coloring matter, is soluble in alcohol or ether, and crystallizes readily. A larger quantity of the product is obtained by employing muriatic acid, and allowing the reaction to take place spontaneously. After a few weeks, a great many warts with an acicular crystallization are found. These, when pulverized and well washed, furnish a nearly white product after the first recrystallization; whereas, when sulphuric acid is employed, white nacreous crystals cannot be obtained without great trouble, the resinous coloring matter which accompanies this product being got rid of with difficulty.

This crystalline principle is not a salt; it is neutral, and reagents do not indicate any trace of the acids employed in its preparation. I call it *colchiceine*, as it differs from the colchicine of Hess and Geiger, which, as I shall show, appears to be a complex product.

The properties of colchiceine are as follows:—It crystallizes very readily in nacreous lamellæ; it is almost insoluble in water, but communicates to this vehicle a slight bitterness, which is perceptibly increased by ebullition. At this temperature a considerable portion of the product is dissolved, but this is deposited immediately after refrigeration. The solvents of colchiceine are alcohol, ether, methylic alcohol and chloroform, which when in contact with it acquire a very intense and persistent bitterness.

The alcoholic solution of colchiceine is colored by the addition of bichloride of platinum, and no precipitate is formed. Pure and concentrated nitric acid dissolves colchiceine; it acquires a very intense yellow color, passes to violet, then deep red and bright red, and returns to its original yellow color.

Concentrated sulphuric acid dissolves it, forming a solution of a very intense yellow color, which is retained even after dilution with water; in course of time brownish flakes are formed. Muriatic acid dissolves it with a bright yellow color. Lastly, acetic acid also dissolves it, but without alteration of color.

Colchiceine is soluble in ammonia, and crystallizes by evaporation in the air; it is soluble in caustic potash, acquires a green color with perchloride of iron, and presents no change of color or turbidity in presence of solutions of neutral or tribasic acetate of lead, of nitrate of silver, of perchloride of mercury, or infusion of nut-galls.



Colchiceine appears to be capable of combining with baryta; if saturated solutions of hydrate of baryta and colchiceine in methylic alcohol be mixed together, a voluminous precipitate is soon formed; this is gelatinous and soluble in wood-spirit, and even in an excess of the solution of baryta.

Colchiceine is unalterable in the air, and has no action upon red or blue litmus-paper. When exposed in a tube to the heat of the oil-bath, it softens at first, and fuses at  $311^{\circ}$  F.; if the temperature be raised, it becomes colored at about  $392^{\circ}$  F. When heated upon a platinum plate, it fuses, acquires a yellowish color, and burns, leaving only a trace of a spot which has no action upon moistened test-papers. When heated with caustic potash, it evolves a gas which renders reddened litmus-paper blue. When calcined with potassium, according to the process of M. Lassaigne, a residue is obtained, which, treated with a solution of a sesquisalt of iron and afterwards with muriatic acid, furnishes a blue liquid, the deposit from which is prussian blue.

The presence of nitrogen being proved by these two experiments, I submitted colchiceine to elementary analysis, with the following results:—

	Calculation.	Experiment (average).
C	62.83	62.669
H	6.60	6.560
N	4.19	4.298
O	26.38	26.473

*Pre-existence of Colchiceine in the Seeds of Colchicum.*—As this substance might be the result of the action of reagents upon the normal materials of the seeds of the *Colchicum*, I endeavored to ascertain its pre-existence, and believe I have succeeded by proceeding in the following manner:—

I dissolved the alcoholic extract of the seeds of *Colchicum*, previously freed from oil and starchy matter, in alcohol and decolorized it by well-washed charcoal; after filtration, the charcoal was treated repeatedly with boiling alcohol, which was added to the first liquid. The syrupous extract which remained after distillation, when dissolved in water and slightly acidulated with very dilute sulphuric acid, gives rise to a flocculent precipitate; the liquid, when filtered and left for some weeks, produces the warty crystals previously described. These crystallize in alcohol, and are identical with colchiceine.

The action of acids upon analogous bodies having given rise to decompositions producing peculiar principles and glucose, I endeavored to ascertain the presence of the latter in the mother-liquors from which the crystals of colchicine were deposited, but I only succeeded in isolating a resinous matter, insoluble in water, combined with some coloring matter and very soluble in alkalies, a product consequently of an acid nature. The characters of this resinous matter are, that it is soluble in alcohol and ether, acquires a blood-red color with nitric acid, and dissolves in ammonia, to which it also gives an intense red color.

*Physiological Experiments.*—According to experiments made by Prof. Schroff\* of Vienna, the colchicine obtained according to the process of Hess and Geiger has a poisonous action upon rabbits even in doses of 0.01 grm.; the animal only dies in from twelve to eighteen hours. Given in large doses, even of 1 grm., it does not produce death in less than seven or eight hours. When colchicine is injected into the stomach in a dose of 0.01 grm., the animal does not die for ten or twelve hours, but in a dose of 5 centigrms. it causes a complete paralysis of the members and death in a few minutes.—*Chemical Gazette*, March, 1857, from *Comptes Rendus*, Dec., 1856.

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#### ON THE PRODUCTION OF MANNITE BY MARINE PLANTS.

By Dr. T. PHIPSON.

It has been for some time known that certain marine algæ produce, when dried in the open air, efflorescences of mannite (sugar of manna) on their surface. Of this number are *Laminaria saccharina*, *D. digitata*, *Rhodomenia palmata*, *Fucus siliquosus*, *F. nodosus*, *F. vesiculosus*, *F. saccharinus*, *F. serratus*, &c. In 1855, I observed this production of mannite on many of these algæ (which are very common), and especially on the *Laminaria saccharina*, the *Fucus vesiculosus*, and its numerous varieties, the *F. serratus*. I have no doubt, that all the algæ which contain vegetable mucilage produce this substance, when in conditions favorable to its formation.

\* Oesterreich, Zeitschr. für prakt. Heilkunde, June 6, 1856.

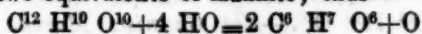
Some botanists have thought that the production of mannite, by marine plants, was in consequence of a *secretion* of the substance in question by the living plant; but I have proved that this saccharine matter is only produced after the vital activity of the plant has ceased. Moreover, my observations on this point lead me to believe, that the production of mannite is always the result of a peculiar kind of fermentation, which disoxidises the vegetable mucilage and transforms it into mannite.

We know that many of the marine algæ contain such large quantities of mucilage, that some naturalists have tried to render this production useful as a manufacture. For instance, Mr. Brown has found that prolonged boiling with dilute sulphuric acid suffices to convert this substance into *arabine* (gum arabic).

I have obtained very large quantities of mannite after removing the algæ from the water, by placing them still moist between sheets of grey paper, so that the access of air is not prevented, and leaving them there for eight days. At the end of this time, the surface is covered with an efflorescence of mannite. It is in this case formed more in the shape of grains than in crystals, but when dissolved in water, such as is furnished by the plant, it crystallises, by the evaporation of the liquid, in long, acicular and colorless tufts.

I account for its production in the following manner:—

Supposing that the mucilage has the formula attributed to it,  $C^{12} H^{16} O^{10}$ , and which represents the composition of this substance dried *in vacuo* at  $180^{\circ} C.$  ( $266^{\circ} F.$ ), we find that in the presence of water and losing one equivalent of oxygen, it may be divided into two equivalents of mannite; thus—



Veg. mucilage + water = mannite + oxygen.

It is, consequently, by means of a *disoxidising influence* exerted on the mucilage, that mannite is produced. This substance is likewise produced during viscid fermentation, as is well known, in which case a viscid matter is formed of the nature of the gums (in wine, beer, and vegetable juices as they spoil), and in these circumstances the mannite produced, proceeds evidently from the disoxidising action which the fermenting matter exercises on this viscid substance.

I have often observed, that the intercellular mucilage of ma-

rine algæ, being decomposed during the production of mannite, the superficial tissue of the plant is deteriorated; this is especially the case with *Laminaria saccharina*, one of the algæ which furnishes the most mannite; with the microscope we perceive, that the pulverulent and white layer of mannite is accompanied by a great many isolated spherical cellules, proceeding from the destruction of the plant; water put to them dissolves the mannite, and leaves these cellules at liberty. A piece on which there was no mannite, showed these same cellules in juxtaposition and implanted in the mucilage, forming a continuous smooth layer, which becomes pulverulent by the formation of mannite.

The body which causes the alteration of the mucilage in the algæ, is probably the albuminous matter which all these vegetables contain, and which decomposes in the air, causing, by prolonged decomposition, those disagreeable odors which characterize the putrefaction of the algæ, as well as those of fresh as of sea water.

The production of mannite: 1st, by marine algæ; 2d, by the viscid fermentation of wine and beer; 3d, by the decomposition of mucilaginous vegetable juices, such as those of the beet root, dog's grass, ash, &c., leads us to imagine that the origin of this saccharine matter is vegetable mucilage, rather than *sugar*, as many chemists have supposed. I think we may venture to say that wherever, in nature, there exists at once vegetable mucilage and a disoxidising action, mannite will be produced.

It appears probable, that the viscid substance produced during the decomposition of many beverages, and whose real nature has only lately been suspected, is nothing but vegetable mucilage of the formula  $C^{12} H^{10} O^{10}$ .—*The Chemist*, March, 1857, from *Comptes Rendus*, Dec., 1856.

#### AMYLENE; A NEW ANÆSTHETIC AGENT.

Dr. Snow, in a paper read before the Medical Society of London, on the 10th of January, and since published in the *Medical Times and Gazette*, has directed attention to amylene as an anæsthetic agent, and numerous trials of this substance for producing insensibility are now being made. In the paper alluded to Dr. Snow briefly traces the history of the introduc-

tion. He gives the following quotation from Sir Humphrey Davy's *Researches concerning Nitrous Oxide*, published in the first year of this century: "As nitrous oxide in its extensive operation seems capable of destroying physical pain, it may probably be used with advantage during surgical operations in which no great effusion of blood takes place." About forty years after the publication of this sentence nitrous oxide was used with doubtful success by Mr. Wells, a dentist, of Hartford, Connecticut, in some cases of tooth extraction: but its use was speedily relinquished, the effect being considered uncertain. In September, 1846, Dr. Morton, who had previously been in partnership with Mr. Wells, and had witnessed the trials with nitrous oxide, administered the vapor of sulphuric ether with success in a case of tooth drawing, and afterwards in surgical operations. This led to the general use of ether vapor. In 1847 Mr. Jacob Bell substituted the substance known as chloric ether for sulphuric ether, and this, although not sufficiently active, was found to produce insensibility. In the autumn of 1847 Mr. Waldie, of Liverpool, being in Edinburgh, explained to Dr. Simpson that the so-called chloric ether was a solution of chloroform in spirit, whereupon the latter obtained some pure chloroform and administered it with great success. Dr. Snow states, "Ever since the introduction of chloroform I have been of opinion that other agents would be met with more eligible for causing anæsthesia by inhalation. It seemed improbable that this one, which happened to be standing on the shelf of the Pharmaceutical Chemist for another purpose, should be better than all the very numerous volatile compounds which organic chemistry is daily bringing to light; and the continued use of chloroform is probably due to the circumstance, that hardly any one has made anæsthesia by inhalation a subject of constant and protracted investigation. I have from time to time made experiments on animals with a variety of substances, and I find that the agents which might be inhaled for the prevention of pain, in the absence of others which are more eligible, are extremely numerous. They include, among other things, carbonic acid and carbonic oxide gases, olefiant gas, the vapor of hydrocyanic acid, and cyanogen gas; which last is contained, as I found, in the fumes of the puff-ball, which Dr. Richardson brought before the notice of this Society. The



agents which I have exhibited as anæsthetics to the human subject, in addition to ether and chloroform, have as yet been but few. They are nitric ether, Dutch liquid, benzin or benzole, a bichloride of carbon, made by decomposing chloroform with chlorine gas, the monochlorinetted chloride of ethyle, and amylene, the subject of this paper. Nitric ether was exhibited also by Dr. Simpson, and Dutch liquid by him and Dr. Nunneley. These substances possess no advantage over chloroform, unless it be in their slower action, while in other respects they are scarcely so agreeable. With regard to benzin, I discontinued the use of it on account of convulsive tremors which it occasioned in a case of amputation in St. George's Hospital. I found that these tremors are a constant result when its effects reach a certain stage. I administered the chlorinetted muriatic ether in twenty surgical operations in the summer of 1851, chiefly in King's College Hospital. Its sensible and physical properties and its effects, are nearly the same as those of chloroform, but I thought that it might possess some advantage in the circumstance that, being less volatile, while its other properties are the same, it would be less liable to cause accident, even if incautiously used. I was, however, prevented from using it further, owing to the great difficulty of procuring it in a state of purity." He further states: "I was not aware of the existence of amylene till a few months ago, or I should have tried it sooner; for I made inquiry in 1848 for a substance named eupion, by Reichenbach, its discoverer, but was unable to obtain it. Eupion is a carbo-hydrogen, described as having all the physical characters which belong to amylene, though obtained in a different way, and I believe it is the same substance. Reichenbach obtained it from coal-tar, but other chemists have not been able to make it."

Dr. Snow describes several cases in which he has administered amylene, and says:

"The relative advantages and disadvantages of amylene may, as nearly as I can judge, be summed up as follows:—In regard to its odor, it is more objectionable than chloroform, but much less so than sulphuric ether. The odor of any volatile substance is, however, no longer perceived after a patient begins to inhale. In respect to its pungency, it has a great advantage over both ether and chloroform, being much less pungent than either of

them. Thus, whilst the patient, especially if a female, often complains of a choking feeling and want of breath, in commencing to inhale chloroform, and two or three minutes are lost before the vapor can be inhaled in any useful quantity, she can begin to inhale the amylene of full strength within half a minute from commencing, and the operation may generally be begun within three minutes. In the amount which suffices to produce insensibility, it is intermediate between chloroform and ether, chloroform having the advantage. Amylene has an advantage, in preventing pain with a less profound stupor than that occasioned by the other agents, and in the ready waking and recovery of the patient it has an advantage over chloroform, and a still greater advantage over ether. Its probable safety I have spoken of;\* and the greatest advantage of all, if it should continue to be met with in all cases, is the absence of sickness from its use. The almost entire absence of struggling and rigidity may also be mentioned as an advantage of amylene over ether and chloroform."

*Preparation and Properties of amylene.*—Amylene was discovered and described in 1844 by M. Balard, of Paris. It is made by distilling fusel oil, or amylic alcohol (the only liquid which is separated from spirit of wine in the process of rectification,) with chloride of zinc. On adding the fusel oil to a concentrated solution of chloride of zinc while they are cold, solution or admixture does not take place, but on applying heat they mix and form a homogeneous liquid, which begins to distil at a temperature of about 266° Fah. On re-distilling the product thus obtained, the ebullition which commences at 140° Fah., rises during the process to about 570° Fah. The most volatile parts of this distillation are to be separated, and agitated with concentrated sulphuric acid, when the amylene in a pure state will rise to the surface. It is colorless, very mobile, and has a low specific gravity (stated by Dr. Snow to be 0.659 at 56° Fah.) Its boiling point is 102° Fah., and the density of its vapor is 2.45. It has a peculiar and disagreeable smell. Its composition is represented by the formula  $C_{10}H_{16}$ . It is soluble in alcohol and ether

\* The author states, "While I cannot venture to predict for it the absolute safety which seems to attend sulphuric ether under all circumstances, I confidently trust that it will be perfectly safe with careful management."

in all proportions, but is very sparingly soluble in water. Specimens prepared by different manufacturers have been found to present some difference in their sensible characters, which probably arises from the circumstances that the fusel oil from which it is made is not a definite body of uniform composition, and that the amylic alcohol, the principal constituent of the crude fusel oil, is not easily isolated in a state of purity. Should it be found that amylene cannot be always obtained in an uniform state, this will be a serious obstacle to its successful employment as an anæsthetic agent.—*London Pharm. Jour.*, February, 1857.

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IODIDE OF ANTIMONY.

Mr. W. Copney, of St. Mary's Hospital, brought this preparation under the notice of the Meeting. It had been recently introduced as a therapeutical agent at the hospital to which he was attached, and as it was a substance not met with in commerce, he had been requested by Mr. Ure, surgeon to the hospital, to prepare some of it. He had not found any detailed account of the process for making it in the books generally accessible to Pharmaceutists, and therefore thought that a few particulars on this point might be acceptable. After the trial of several methods for effecting the combination of the elements, which proved more or less inapplicable or inconvenient, he adopted the following as that which afforded the most satisfactory result:—

A quantity of metallic antimony, having been reduced to a coarse powder, was mixed gently with pure iodine, in the proportion of three equivalents of the latter to one of the former. The mixture was transferred to a Florence flask, and cautiously heated over the gas flame. Combination speedily took place, with a great and sudden increase of temperature and the liquefaction of the contents of the flask. By way of precaution the neck of the flask was lightly plugged with cotton wool, to act as a yielding impediment to the projection of any of the materials, or the escape of the vapor of iodine during the process. The heat being withdrawn, the flask was allowed to cool, then broken, and the contents removed.

Teriodide of antimony, thus prepared, was found to be a somewhat crystalline or foliated mass, having a semi-metallic appear-

ance. On scratching the surface the part became distinctly red. By trituration a deep orange-red powder was obtained. It readily fuses into a dark red liquid. By continuing the heat it is sublimed in the form of crystalline or plumose laminæ of a yellowish-red color.

Triturated or shaken with water, it became of a yellow color, this being a subiodide or oxyiodide resulting from the abstraction of iodine by, and in the production of hydriodic acid with the hydrogen of, the water; a behaviour analogous to that of the chloride of antimony when similarly treated.

The form of administration adopted was that of pills; the dose a quarter of a grain to a grain. As an outward application it was used suspended by means of mucilage.

An attempt was made to prepare a solution similar to Donovan's, substituting antimony for arsenic. As anticipated, the liquid refused to retain the iodide of antimony. It is probable, however, that with an excess of hydriodic acid, and by preparing a much stronger solution, a liquid of this kind might be prepared; but it is also probable that it would be impossible to make a mixture of it without its becoming decomposed.—*London Pharm. Jour.*, February, 1857.

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ON THE OPTICAL CHARACTERS OF CERTAIN ALKALOIDS ASSOCIATED WITH QUININE, AND OF THE SULPHATES OF THEIR IODO-COMPOUNDS.

By WILLIAM BIRD HERAPATH, in a letter to Professor Stokes, Sec. R. S.

You will probably recollect that I sent you some time since a small portion of an alkaloid, which at that time was called quinidine in Germany, but it has since been distinguished from it and named cinchonidine. You then examined it for epipolism or fluorescence, and you pronounced the opinion that it possessed this property only in a minor degree, and you imagined that this arose from the presence of a small per-centage of  $\alpha$ -quinine.

I have since obtained, through the kindness of Mr. J. E. Howard, specimens of the perfectly pure alkaloids quinidine and cinchonidine, and find that quinidine, which I can now identify as the  $\beta$ -quinine of Von Heijningen, possesses the phenomenon of fluorescence or epipolic dispersion as powerfully as  $\alpha$ -quinine; whilst cinchonidine, if perfectly pure, is devoid of it altogether;

and recent experiments have shown me that a small per-centage of quinidine was the cause of the epipolic dispersion found by you in the specimen of cinchonidine sent by me.

It may be as well to state that the cinchonidine tested by water of chlorine and ammonia gave no evidence of green tint, which it would have done if only  $\frac{1}{5000}$ th part of either  $\alpha$ -quinine or quinidine had been present, according to some recent experiments of my own.

I have also found that 1 gr. of pure quinine or quinidine in 35,000 of water will give an evident "*epipolic*" appearance; whilst when diluted with 70,000 grs. of water we have still very evident appearance of "*fluorescence*" upon the perpendicular wall of the glass vessel exposed to the incident light; whilst a bluish milkiness of "*internal dispersion*" may be seen when 1 gr. of either alkaloid is diluted with 700,000 grs. or 10 gallons of distilled water, well acidulated in all these cases with sulphuric acid.

Some other interesting results have followed from these investigations. When quinidine is dissolved in an excess of diluted sulphuric acid, and the solution mixed with about twice its bulk of spirit, and warmed to 130° F., and tincture of iodine then added in sufficient quantity, and subsequently set in repose, beautiful red acicular crystals are deposited; these, upon recrystallization from rectified spirit, acquire an increased size, become beautiful quadrilateral prisms, leaving a deep garnet-red by transmitted light, and possessing a clear bluish-purple reflected tint; they are optically doubly absorbent in a slight degree, and transmit a brownish-orange body-color when polarized perpendicular to axis. The primary form appears to be a rhombic prism, and as far as my present analyses go, appears to possess centesimally the following composition:—

Iodine	.	.	.	.	39.665
Sulphuric acid	.	.	.	.	6.273
Carbon	.	.	.	.	32.890
Hydrogen	.	.	.	.	3.960
Nitrogen	.	.	.	.	4.400
Oxygen	.	.	.	.	5.040
Water	.	.	.	.	8.504

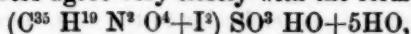
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100.712



The excess arises from the hydrogen twice calculated in water of crystallization.

These numbers agree very closely with the formula



and prove it to be the sulphate of iodo-quinidine, very analogous to the optical quinine compound, yet differing materially in its optical properties.

There is another alkaloid frequently associated with quinidine, which also crystallizes from spirit in the prismatic form like quinidine and cinchonidine, but is another example of epipolism or fluorescence. Its iodo-sulphate is deep olive-green in its reflected tint, orange-yellow by transmitted light, and possessing in an eminent degree optically doubly absorbent powers, thin laminæ being quite black, but still thinner ones give a bistre-brown "body-color" when polarized perpendicular to axis.

This alkaloid was also furnished me by the kindness of Mr. Howard, but has not yet been sufficiently purified, or in the quantity necessary to give certain results.

It possesses one very peculiar property. When dissolved in chloroform and evaporated spontaneously on glass, the gummy and uncrystalline residue, mounted in Canada balsam, at once shows a deep blue-green, epipolic or fluorescent appearance.

Pure cinchonidine does not possess epipolic dispersion and does not become green by chlorine-water and ammonia; and when it is dissolved in acetic acid or chloroform and the fluid is exposed on glass plates to spontaneous evaporation, beautiful crystals in circular spots or drusæ develop themselves, which under polarized light exhibit black crosses and white or colored sectors.

These appearances are not exhibited by pure quinine or true quinidine ( $\beta$ -quinine), both of which give a gummy, uncrystalline, and perfectly transparent residue.

Pure cinchonidine, thus optically and chemically distinguishable from either quinine or quinidine, is still further remarkable for producing with sulphuric acid and iodine an optical doubly absorbent compound of intense power, even equal to the sulphate of iodo-quinine compound; these crystals are very similar in form to my artificial tourmalines, and have long been mistaken by me for them; even at present I can only distinguish them by

the tints in reflected light and the complementary body-color, viz., whilst sulphate of iodo-quinine gives a cantharidine-green reflected tint, and a pink, ruby-red, reddish-brown or black body-color when polarized perpendicular to the axis, according to the thickness of the plate examined, the sulphate of iodo-cinchonidine is golden-green by reflected light, and gives a sky or indigo-blue or black "body-color" when polarized perpendicular to the axis. I have not yet made sufficient chemical analyses of this substance to enable me to decide on its formula, but I have obtained 39.307 per cent. iodine and 8.864 per cent. sulphuric acid, which sufficiently indicate a chemical difference in constitution from the sulphate of iodo-quinine, which it may be remembered, contains 32.609 per cent. iodine and 10.61 per cent. sulphuric acid.

I hope soon to present these results in more detail when sufficient leisure is afforded me for the purpose.—*Chemical Gazette*, March 2, 1857.

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#### ON GOLD IN THE FORM OF MALLEABLE SPONGE.

By D. FORBES, F. G. S.\*

Of late years, gold in a peculiar state of aggregation has been imported from America for the use of the dentists, and sold at prices between £7 and £8 per ounce. The gold is in the form of flat cakes about two-tenths of an inch thick, and has a reddish-brown color and peculiar spongy texture.

By the force of the fingers it can be welded or kneaded into a pellet without crumbling, and becomes by the pressure of a tool nearly as solid as ordinary gold. It is therefore well adapted for dental purposes.

The process by which it is said to be made is patented in America, and consists in repeatedly dissolving, precipitating, amalgamating, heating, &c., so extraordinary that it is probably only put forward to deter others making it. On trial, gold of a similar spongy character was obtained by the following method:—

Gold free from copper is dissolved in nitrohydrochloric acid, keeping an excess of gold in the solution towards the close of the operation, so as to get rid of all nitric acid and avoid subsequent evaporation; any chloride of silver present is filtered

off. The solution of gold is now placed in a flat-bottomed vessel and heated, and a strong solution of oxalic acid added; in a few hours the whole gold is deposited, and the supernatant liquid may be decanted off, taking care all the time not to disturb the gold at the bottom, and the vessel is then several times filled up with boiling water and decanted until the last washings contain no more oxalic acid.

The gold is now carefully slipped on to a piece of filtering-paper, and by means of a spatula gently pressed into the form of the desired cake, but somewhat thicker; it is then removed to a porcelain crucible, and heated for a short time somewhat below a red heat, when it shrinks in dimensions, becomes coherent, and is similar to the American product in properties.

As the American gold is of a reddish hue, it is probably precipitated by protosulphate of iron, and not by oxalic acid.—*Chemical Gazette*, Feb. 1, 1857.

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#### ON STORAX.

By DANIEL HANBURY.

“Verum ad accuratum ac diligentem *Materia Medica* tractationem instituentem, remedii cujusque historiam et virtutes à medicis recensitas exponere non sufficit; sed etiam multa insuper consideranda sunt ac perpendenda.”—GEOFFROY, *Tract. de. Mat. Med.*

Writers on *Materia Medica*, ancient as well as modern, have generally concurred in applying the name *Storax* or *Styrax* to two distinct substances namely *Liquid* and *Solid Storax*. I might almost say to two *groups* of substances, since each comprehends two or more varieties.\*

The plant to which *Storax*, at least the solid kind, is commonly referred, is *Styrax officinale* Linn., a small tree of the Nat. Ord. *Styracææ*, occurring in Provence, Italy and the Levant. It is this tree, to which all authors admit, the account of *Storax* given

\* A conventional distinction of confining the name *Storax* to the solid drug and *Styrax* to the liquid, is adopted by some modern authors. But as such a use of terms leads to some inconsistency, I have not adopted it, but employ the word *Storax* as the English equivalent of the original Greek word *Στίραξ*.

by Dioscorides in the first century, refers.\* In fact, it is not unreasonable to suppose that a tree so nearly allied to that producing Benzoin, should be capable of affording an analogous product.

That it may under certain favorable circumstances exude a fragrant resin, even in France and Italy, we know from the positive testimony of two authors, the first of whom, Duhamel, has written in these words :

"J'ai trouvé en Provence, près de la Chartreuse de Montrieu, sur de gros Aliboufiers, des écoulements assez considérables d'un baume très-odorant. Il n'est pas douteux, ce me semble, que ces Aliboufiers ne fournissent du Storax."†

The second author is the Abbé Mazeas who, in a communication under date 18 Jan. 1769 addressed to the *Journal des Scavans*,‡ states that on a plain in the neighborhood of Tivoli, near Rome, sheltered on the N. and N.E. by a chain of mountains contiguous to Monte Genarro, Rocco Giovane, S. Polo, &c., which form a semi-circle open to the south,—in fact, in a very warm situation,—the *Styrax* shrub yields by incisions in its bark the valued exudation known as *Styrax en larmes*.

As the account of Storax left us by Dioscorides, who was a native of Cilicia, one of the countries affording the drug, is important, I will here give its literal translation, subjoining in a note the Latin text of Sprengel, the latest commentator upon that author.

[This Latin has been omitted to gain space.—ED.]

Storax is the exudation of a certain tree resembling a quince tree. It is preferred yellow and shining, resinous, having whitish lumps, retaining

\* Perhaps I ought to except Professor Orphanides of Athens, who has hinted that the text of Dioscorides on the subject of Storax, requires correction. *Bulletin de la Société Botanique de France*. T. iij. p. 147.

† *Traité des Arbres*. Paris, 1755. 4to. T. ij. p. 289. Montrieu or Montrieux is a little place about 10 miles to the north of Toulon, in the department of the Var. In this neighborhood, the *Styrax* grows wild.

In order to endeavor to obtain an authentic specimen of the exudation of *Styrax officinale*, I wrote to my friend Dr. Planchon of Montpellier, who at my suggestion kindly caused incisions to be made during the hottest part of last summer, in the trunk and branches of a large and fine *Styrax* growing in the Botanic Garden there. The experiment was quite unsuccessful: neither aqueous sap nor resinous juice flowed from the incisions.

‡ Vol. for 1769, p. 105.

for a long period a very grateful odor; when softened, it emits a certain honey-like humidity. Such is the Gabalite, the Pisidian and the Cilician [Storax.] That of bad quality is black, friable and branny. There is also found an exudation resembling gum, transparent, myrrh-like; but this is produced rarely. Storax is adulterated with the powder of the tree itself, made by the erosion of little worms, honey and the dregs of iris\* and some other things, being added. There are those who pound with storax in very hot weather, either wax or tallow imbued with aromatics, and press it through a strainer having wide openings, into cold water, forming as it were, little worms; they sell this, which they call *vermiform Storax*. Inexperienced persons admit it as genuine, not regarding its remarkably powerful odor; for that which is not fraudulent is somewhat strong.

The particulars given by Pliny in this chapter on Storax, are very minute and explicit, although his supposition that the drug packed in reeds was a natural production, and his notion of it being attacked by insects, must be regarded as erroneous.

The following is Pliny's account:

"That part of Syria joining up to Judæa, and lying up to Phœnicia, produces *Storax*, which is found in the vicinity of Gabala and Marathus, as also of Casius, a mountain of Seleucia. The tree bears the same name, and has a strong resemblance to the quince. The tear has a harsh taste, with a pleasant smell; in the interior it has all the appearance of a reed, and is filled with a liquid juice. About the rising of the Dog-star, certain small winged worms hover about this substance and eat it away, for which reason it is often found in a rotten state, with worm-holes full of dust. The Storax next in estimation after that already mentioned, comes from Pisidia, Sidon, Cyprus and Cilicia; that of Crete being considered the very worst of all. That which comes from Mount Amanus, in Syria, is highly esteemed for medicinal purposes, and even more so by the perfumers. From whatever country it comes, that which is of a red color is preferred, and it should be both unctuous as well as viscous to the touch; the worst kind is that which crumbles like bran, and is covered all over with a whitish mould. This substance is adulterated with the resin of cedar or with gum, and sometimes with honey or bitter almonds; all which sophistications may, however, be detected by the taste. The price of storax of the best quality is seventeen denarii per pound.† It comes also from Pamphylia, but this last is more arid and not so full of juice."‡

The localities here mentioned, include those cited by Dios-

\* Possibly some residue obtained in making the preparation called *Irini spissamentum* described lib. I. cap. LXVI.

† Equal to 16s. per lb. avoirdupois.

‡ Pliny's *Natural History*, Bostock and Riley's translation: Book xij. Chap. 55.



corides: and most of them can be identified. Gabala is the modern village of Djebelch, a few miles to the south of Latakia. The ruins of Marathus still exist. Casius and Amanus are mountains near the Gulf of Iskenderun, still to be traced under Turkish names. The position of the ancient countries of Pisidia, Pamphylia and Cilicia in the south-eastern part of Asia Minor is well known: and Sidon, Cyprus and Crete are familiar to all. In several of these localities, *Styrax officinale* is, at the present day, a common wild shrub.

The drug thus described by these ancient authors, is that which I conceive to be the original and legitimate Storax, namely a fragrant resin in separate, or more or less agglutinated tears, somewhat resembling Benzoin, exuded either spontaneously or after incision, from the trunk of the *Styrax officinale* of Linnæus. That such a drug, in a state of greater or less purity, was in former, and even in comparatively recent times, an article of commerce, appears certain from the specimens still existing in a few old collections of Materia Medica, as well as from the descriptions of the best Storax given by the pharmacologists of the last century agreeing very fairly with the account left by Dioscorides.\*

This fine kind of Storax, always extremely scarce, was called *amygdaloid*, from the small, white, almond-like tears of which it partially consisted. It also bore the name *Styrax calamites*, a term derived from the ancient method of packing it in reeds (*calami*).† It has, however, wholly disappeared from commerce, its name alone *Styrax calamites* or *calamita* being retained in favor of that odoriferous, sawdust-like compound which we are accustomed to find in the shops. In France, it is applied to a black, extractiform, odoriferous substance which I shall more particularly describe in a future paper.

\* See especially Kirsten, *Exercitatio de Styrace*, Altorf, 1736. 4to.

† According to Matthioli, the allusion to *Calami* in connexion with Storax first occurs in Galen. I find the passage to be as follows:

“Manifestum insuper est Styracem qui in calamis à Pamphiliâ apportatur, Andromachum præcipere. Paucissimus autem illic styrax nascitur: tantumque ab hoc vulgari distat, quantum à vino quod in tabernis venditur Falernum.” (Galen. *De Antidotis*, lib. i. cap. 14.)

The term *Calamites* has been supposed to be derived for καταβαλίτης, a vulgar reading for γαβαλίτης, as explained at length by Matthioli (*Comm. in lib. I. Dioscorid. cap. LXVIII.*)

Although we possess no modern account of the collection of solid Storax, confirmatory of that given by Dioscorides, other than those I have quoted (which do not, however, relate to collecting the drug for the purposes of commerce,) there exist two remarkable statements of the method of collecting *Liquid Storax*, which it will not be unprofitable to examine with some attention. I ought, however, first to state that it is questionable whether the Greeks were acquainted with *Liquid Storax*: Arab writers on the other hand, distinctly mention it, though their accounts are far from satisfactory and clear.\*

The first of these two statements is that of James Petiver, an apothecary of London, who was noted as the possessor of a considerable collection of objects of natural history.

In the year 1708, that is ten years before his death, Petiver presented to the Royal Society of London a communication which, *verbatim et literatim*, is as follows:

"The Manner of making *Styrax liquida*, alias *Rosa Mallas*.

Communicated by Mr. James Petiver, F.R.S.

*Rosa Mallas* grows upon the Island *Cobross*, at the upper end of the *Red Sea* near *Cadess*, which is 5 days' Journey from *Suez*: It is the Bark off a Tree (taken off every Year, and grows again) boiled in Salt Water till it comes to a Consistence like Bird-lime, then separated and put into a Cask and brought to *Judda*, and so to *Mocha* in *June* and *July*, where it sells from 60 to 120 Dollars per Barrel, according to its Goodness: the best is what is freest from Clay and Dirt, which is commonly mixed with it; and the way to try it is by washing it in Salt Water which will cleanse it: The *Arabs* and *Turks* call it *Cotter Mija*.

N.B. A Barrel is 4201."†

A statement so precise and circumstantial was received with more or less credit, and we find it quoted by Geoffroy,‡ Hill,§ Alston,|| Mérat and DeLens,¶ Martiny,\*\* Guibourt,†† Pereira,‡‡ Royle,§§ &c.

\* *Avicennæ Liber Canonis*, lib. II. tract. 2. cap. 431. 600. 622. (ed. Venet. 1564.)

† *Philosophical Transactions*, 1708-1609. Vol. xxvi. p. 44.

‡ *Tract. de Mat. Med.* (1741,) T. II. p. 493.

§ *History of the Materia Medica* (1751,) p. 713.

|| *Lectures on the Materia Medica* (1770,) Vol. II. p. 418.

¶ *Dictionnaire de Matière Médicale*, T. IV. (1832,) p. 128

\*\* *Encyklop. d. med.-pharm. Nat. u. Rohwaarenk.* Bd. I. (1843) p. 94.

†† *Histoire des Drogues Simples*. T. II. (1849,) p. 294.

‡‡ *Elem. of Mat. Med.* Vol. II. (1850,) p. 1216.

§ *Manual of Mat. Med.* (1853) p. 639.

Hill, indeed, quaintly remarks, "it is a little unlucky that nobody has given us any description of this *Rosa Mallas*."—But is *this* the only ambiguity? Let us first ask,—*Does there exist any island of Cobross at the upper end of the Red Sea?*

Thanks to the excellent chart of the Red Sea made from the surveys of Messrs. Moeresby and Carless in 1830–33, and to the minute *Sailing Directions for the Red Sea*, both published by the Hon. East India Company, we have a mass of very exact and positive information relating to its coasts, and to its islands from the largest down to the very rocks and shoals. Now Petiver makes his island of *Cobross* to be "*near Cadess which is 3 days journey from Suez*." To what distance we ought to consider this to be equivalent, I know not; but it is evident from the chart already referred to, that there is no island in the Red Sea nearer to Suez than about 160 miles. Neither this island, nor any other in the Red Sea, bears the name of *Cobross*, or any other name which can be supposed to represent it,—that is, so far as my researches have gone, and I have taken much pains in investigating subject.

Again,—are there any islands in the Red Sea extensively wooded, as Petiver's account would lead us to suppose? On this point, the minute information in the *Sailing Directions*, is entirely of a negative character.

Distrusting my own judgment in such a question, I applied to John Walker, Esq., Geographer to the Hon. East India Company, and to the Rev. Charles Forster, author of the *Historical Geography of Arabia*, gentlemen whose acquaintance with sources of information on such matters, might, I thought, suggest some explanation of Petiver's statement: but neither of them has been able to throw any light upon it.

Although I am unable to find a *Cobross* in the Red Sea, I must state that D'Herbelot in his *Bibliothèque Orientale* gives *Cobros*, as a synonym of *Cyprus*: and also, that Pliny mentions an island of *Coboris* or *Covoris*, which has been identified as one of the Sohar Isles, near Burka, a town situated on the East coast of Arabia, near the entrance to the Persian Gulf.\* The position of either of these islands is, of course, perfectly irreconcilable with that of Petiver's *Cobross*.

\* Forster's *Historical Geography of Arabia*, Lond. 1844. Vol. ij. p. 230.

It is somewhat surprising that of the many authors that have quoted Petiver's account of *Liquid Storax*, none appears to have been struck with the fact that the drug is not said to be conveyed from "Cobross" to Europe, but that it is "*brought to Judda, and so to Mocha*,"—that is to say, it is carried to a spot some 1300 miles south of Suez.

So much for the fallacies in Petiver's account of "The manner of making *Styrax Liquida*." In a future part of this notice, I will endeavor to show what traces of truth it contains.

The next statement on which I propose to offer some remarks, is that of Dr. X. Landerer of Athens, as contained in a communication published in Buchner's *Repertorium* for 1839.†

This communication, I translate thus :

The Storax plant, *Styrax officinalis*, is found in various parts of continental Greece, as well as in some of the islands of the Archipelago. There, however, it forms but a small shrub and does not possess the agreeable odor ascribed to it by botanists. The bark of the plant occurring in Greece, has not the slightest odor, which probably is due to neglect in cultivation. On the contrary, such is not the case with the plant as found in the Turkish islands of Rhodes and Cos, and especially with it as cultivated by the people of Cos. (a)

As I obtained some time since in Syra from a merchant coming from Rhodes some information on the subject, I will make it public, not doubting that, though but little, it will be acceptable.

The Storax plant is called in Cos and Rhodes *βουχούρι* (*buchûri*.) At its flowering season, it fills the air with the most agreeable vanilla-like perfume. At the period for the collection of the bark and younger twigs, which are employed for the preparation of *Buchuri-jag*, i. e. *Styrax-oil* (*oil* being called in Turkish, *jag*), permission is obtained from the Pasha residing at Rhodes, a small sum being paid for it. Those who are provided with the permission to collect, now make with small knives longitudinal incisions and peel off from the stem the fresh pieces of bark in the form of little narrow ribbons. Owing to their adhesive juice they easily stick together [*backen sie leicht zusammen* ;] from them are formed masses of one oke weight (=2lbs.), which are reserved for the preparation of *jag*, or are immediately purchased by Rhodian merchants and sent to Rhodes.

The preparation of *Buchuri-jag* is effected by merely pressing the before-mentioned masses in presses somewhat warmed, called *Styrakia*, and not by boiling. The *jag* obtained by gentle pressure is of an unctuous consis-

† *Einige Worte über die Gewinnung des Storax liquidus* vom Prof. und Leibapotheker X. Landerer in Athens, *Buchner's Rep. für d. Pharm.* Bd. 18. s. 359-362.

tence, a light grey color, and diffuses a very agreeable vanilla-like odor. This is the only sort that is exported; but in Cos and Rhodes, it is also used in the preparation of a very odoriferous mass made by the addition of finely-powdered Olibanum, and formed into cakes of the size of a fist, which are called *Styrakia*. The preparation of these masses belongs exclusively to the conventual clergy, who distinguish their manufacture with the convent seal.

By repeated warming and stronger pressure, an almost black *Buchuri-jag* is obtained, which is used by the inhabitants themselves for the most healing ointments and medicines.

The bark remaining after the expression of the *jag* is bound together and conveyed partly to Constantinople and partly to Syra and there used for fumigation.

With regard to the decoction of the bark and the adulteration of *Styrax-balsam* with turpentine, the Rhodian merchant assured me that they would not know how to go about it; and that the adulteration with turpentine, might, in case of detection, involve even the punishment of death.

[Note a.] The *Storax* trees appear at that place to be of important value, and are given to the young women as dowry, in the same manner as in Greece; the bride is presented with so many Olive-trees.

That Dr. Landerer has been greatly deceived by his informant will, I think, be very evident from the subjoined testimonies:

1. Niven Ker, Esq., who was for several years British Consul at Rhodes, informed me that he was quite ignorant of the carrying on in that island of the manufacture described by Dr. Landerer.

2. Sidney H. Maltass, Esq. of Smyrna, in a letter to me under date 7 October, 1853, speaking of *Liquid Storax*, says, "Cos and Rhodes produce none."

3. Lieutenant Robert Campbell R. N., H. B. M. Consul at Rhodes, writes from Rhodes under date 16 December, 1855, that Mr. Landerer in attributing to the Islands Cos and Rhodes the production of *Storax*, has committed an egregious error, as they have never produced it.

Moreover, the evidence of Mr. Maltass proves, as I shall shortly show, that *Styrax officinale* is not the tree yielding *Liquid Storax*.

There are other exceptional points in Dr. Landerer's account, which I will for the present pass over, remarking only that the statement that liability to the punishment of death is incurred in the case of a person being detected adulterating *Storax* with



turpentine, is characterized by Lieut Campbell as "a mere invention."

Previous to detailing the information which I have collected as to the method of preparing *Liquid Storax*, it will be well briefly to review the various opinions which have been held as to its origin.

1. Many of the older writers on *Materia Medica* consider it an artificial compound; Dale, in particular, asserts, that what was found in the London shops in his time (1693) was altogether factitious.

2. Those writers who adopt Dr. Landerer's statement, regard *Liquid Storax* as the produce of *Styrax officinale* Linn.

3. By many authors, *Liquid Storax* is referred to *Liquidambar styraciflua* Linn., a tree found in the southern part of the United States, in Mexico, and in other parts of Central America.

However capable that tree may be of producing an analogous resin, it is well ascertained that the *Liquid Storax* used in England, is all imported from the Levant; and there are sufficient reasons to conclude that such is also the case with that used on the continent and that it is certainly not the produce of America. I therefore dismiss the supposition that the *Liquid Storax* of commerce is of transatlantic origin.

4. By some authors, *Liquid Storax* has been conjectured to be the produce of *Liquidambar altingiana* Blume.

This tree is a native of the islands of the Indian Archipelago and of Burmah, where the inhabitants occasionally extract from it an odoriferous semi-fluid resin; but the product is not abundant, nor does it resemble the *Liquid Storax* of commerce; there is not, moreover, the slightest evidence of it reaching Europe in any quantity.

It is, however, a curious fact that the name by which this tree is at the present day known to the Malays, is *Rasamala*, a word very close to Petiver's *Rosa Mallas*. To this I shall revert in a future page.

5. *Liquidambar orientale* Miller, is regarded by Guibourt, Lindley, the authors of the French *Codex*, and some others, as the source of *Liquid Storax*, an opinion which I shall be able to show to be correct.

Having brought under review the various opinions current as

to the origin of *Liquid Storax*, and stated the points on which I consider them erroneous, I will now proceed to communicate the information which I have myself received regarding the drug from three valued correspondents in the Levant, namely, Sidney H. Maltass, Esq., of Smyrna, Lieut. Robert Campbell, R.N., H.B. M. Consul in the Island of Rhodes, and Dr. James McGrath of Smyrna.

The information is still not quite perfect, but in all essential particulars I believe the following is a correct account of the

*Preparation of Liquid Storax.*

**BOTANICAL ORIGIN.**—The tree from which Liquid Storax is obtained, is *Liquidambar orientale* Miller (*L. imberbe* Aiton), as is proved by specimens of the leaves and fruits procured at my request by Mr. Maltass (see wood-cut).

**LOCALITIES.**—South-west of Asia Minor.—Forests in the district of Sighala, near Melasso; forests near Moughla, and near Giova and Ulla, in the Gulf of Giova; also near Marmorizza and Isgengak, opposite Rhodes.

Mr. Maltass passed through a dense forest of *Liquidambar* between the village of Caponisi and the town of Moughla on the 7th or 8th of May, 1851: he describes it as consisting of trees resembling the plane, but evidently of a different species, the leaf being smaller, and each tree far denser in foliage than the plane usually is. "I also observed," says he, "that most of the larger trees had the [outer] bark stripped off from the trunk and the inner bark scraped off. I gathered some of the fruit and leaves, and proceeded on my journey towards Moughla, my road lying for upwards of an hour through this beautiful forest. I observed that the trees were from twenty to thirty feet in height, but whenever there was a break in the forest and the trees had sufficient air and space, they were of larger growth, many of them being forty feet high, more especially in the immediate vicinity of streams of water. My guide assured me that in some places in the forest in the direction, of Melasso, he had seen some of these trees sixty feet in height. He could not tell me the name of the tree, but stated that an oil was produced from it called *Buchur*, and that the trees were mutilated to obtain it."

**EXTRACTION OF THE LIQUID STORAX.**—In June and July, the outer bark is stripped off on one side of the tree and (according



*LIQUIDAMBAR ORIENTALE* MILL.

From a specimen obtained by S. H. Maltass, Esq., from the coast of Asia Minor opposite Rhodes.  
Fitch, del.

to Lieut. Campbell) made into bundles and reserved for the purpose of fumigation. The inner bark is then scraped off with a semi-circular or sickle-shaped knife and thrown into pits until a sufficient quantity has been collected. Mr. Maltass states that it is then packed into strong horse-hair bags and subjected to pressure in a wooden lever press. Upon removal from the press, hot water is thrown over the bags and they are pressed a second time, after which the greater portion of the resin will have been extracted.

Lieut. Campbell's account is a little different: he says the inner bark is boiled in water over a brisk fire, upon which the resinous part comes to the surface and is skimmed off. The boiled bark is next put into hair sacks and pressed, boiling water being added to assist in the extraction of the resin, or, as it is termed, *yagh* (i. e. oil.)

Dr. McGrath says that the Storax collectors, who are chiefly a tribe of wandering Turcomans called *Yuruks*, are armed with a triangular iron scraper with which they scrape off, together with the juice of the tree, a certain quantity of bark, which they collect in leathern pouches suspended to their belts. When a sufficient quantity has been obtained, it is boiled in a large copper and the separate liquid resin is run into barrels. The residual bark is placed in hair-cloth and pressed in a rude press, the extracted resin being added to the general mass.

The product obtained by the processes here described, is the grey, opaque, semi-fluid resin, well known as *Liquid Storax*.

The bark from which the *Liquid Storax* has been extracted, is emptied out of the bags and exposed in the sun to dry, after which it is shipped to the Greek and Turkish islands and to many towns in Turkey, where it is much esteemed for the purpose of fumigation, although since the disappearance of the plague, its employment has greatly diminished.

This is the substance known to pharmacologists as *Cortex Thymiamatis* or *Storax Bark*, as is proved by abundant specimens sent me by Mr. Maltass.

**ADULTERATION.**—Mr. Maltass says that Liquid Storax is rarely pure, being adulterated by the admixture of sand and ashes.

**COMMERCE.**—Lieut. Campbell states that the quantity of

Liquid Storax annually extracted amounts to about 20,000 *okes* (500 cwt.) from the districts of Giova and Ullà; and 13,000 *okes* (325 cwt.) from those of Marmorizza and Isgengak.

It is exported in casks to Constantinople, Smyrna, Syra and Alexandria. Some is also packed with a certain proportion of water in goat-skins and sent, either by boats or overland, to Smyrna, where it is transferred to casks and shipped mostly to Trieste.

It appears from Mr. Maltass, that formerly the whole, both of the resin and the residual bark, was bought by the merchants of the island of Rhodes, but at what period and under what circumstances this occurred, I have not been able to learn.

[NOTE.—We omit that portion of this paper, which has reference to the derivation of oriental names used in connection with the subject, for want of space.—EDITOR AM. JOUR. PHARM.]

The conclusions to which this long investigation leads, may be thus briefly summed up.

1. That the original and classical Storax was produced by *Styrax officinale* Linn.

2. That always scarce and valuable, it has in modern times wholly disappeared from commerce.

3. That the account of the collection of *Liquid Storax* given by Petiver and Landerer are in many important particulars grossly erroneous.

4. That *Liquid Storax* is the produce of *Liquidambar orientale* Miller, and that it is collected in the south-west of Asia Minor.

5. That the bark of *Liquidambar orientale* Miller, after *Liquid Storax* has been expressed from it, constitutes the *Cortex Thymiamatis* of Europe.

6. That there is no evidence of the *Νάρσαφθον* of Dioscorides being the bark of *Liquidambar orientale*.—*London Pharm. Jour.*, Feb. and March, 1857.

[NOTE.—The satisfactory determination of *Liquidambar orientale* as the source of commercial Liquid Storax leads us to say a few words in reference to the *Liquidambar styraciflua* of this country. The tree grows abundantly in New Jersey near this city and attains a height of fifty feet. In this latitude the tree does not give a resinous exudation, but in Kentucky and further South a soft resin exudes by wounding the bark which possesses a benzoic odor and taste, and is used in the Western States for chewing,



as a masticatory, to sweeten the breath. We have in our possession a specimen of the resin of Liquidambar presented by Mr. Wayne of Cincinnati. It consists of conglomerated tears, varying in color from light yellow to black, and softens when chewed, like tolu. When boiled with milk of lime, the filtered decoction has a light yellow color, and yields a crystalline precipitate on adding muriatic acid, like benzoin. These crystals, in hot water, saturate ammonia, and the neutral ammoniacal solution precipitates sesquichloride of iron in red flocks. They are probably benzoic acid. The figure in the margin gives an idea of this plant, and of its close analogy to the oriental species in the shape of its leaf and fruit vessels.]



#### A METHOD OF IMPARTING A RED COLOR TO BONE AND IVORY.

By DR. J. C. KELLERMANN.

The bone to be colored is laid for fifteen to twenty minutes in very dilute cold nitric acid of the strength of a good vinegar; this dilute nitric acid is obtained by mixing fully  $\frac{1}{2}$  a litre of soft water with about 13 grms. of nitric acid. The bone is then immersed for fifteen to twenty minutes in a solution of protochloride of tin, made by dissolving a piece of the size of a lentil in a pint of water. The objects thus mordanted are then put into the following red-bath, which must first be heated until it begins to boil.

*Red-bath.*—For an experiment on the small scale, take 3 to 5 grs. of fine red carmine, pour to it 10 to 12 drops of ammonia, and stir it up well until the carmine is dissolved; then add about 2 oz. of soft water. In this bath, when heated to boiling, the objects must be left for about fifteen minutes. The tints obtained are more vivid when the boiling of the bath is not continued whilst the objects are in it.

If it be desired to change the tint thus obtained (a very fiery carmine-red) to a more scarlet color, one of the following methods may be employed. When the red-bath begins to boil, and immediately after the objects have been immersed in it, 5 to 10 drops of tartaric acid of the strength of a good vinegar may be added; or the water in which the protochloride of tin is to be dissolved may be mixed with an extremely small quantity of English sulphuric acid.—*Chem. Gaz., from Dingler's Polytechn. Journal.*

## ON PEPSINE.

By W. STEVENS SQUIRE, Ph. D.

Some time since a new medicine, under the name of pepsine, was introduced in Paris, and was extensively used there by Dr. Corvisart and others, apparently with considerable success in dyspepsia and certain cases of consumption. This preparation consists principally of a substance well known to Chemists and Physiologists, the nature and composition of which, however, is but imperfectly made out. It is, in fact, to a principle termed pepsine that the gastric juice chiefly owes its property of converting meat and other matters received into the stomach, into a form in which they can be readily assimilated.

By the term gastric juice is understood a fluid secreted by the stomach, and poured into it through a number of minute tubes, situated in the mucous membrane which forms the interior coat. These tubes are, during fasting, plugged up by a mass of epithelial cells; but when the mucous membrane is irritated by food or by certain other stimulants—pepper, for example—the secretion of gastric juice commences, the plugs of epithelium are expelled, and the juice distils into the cavity of the stomach.

Gastric juice contains about 97 per cent. water, 1.25 per cent. pepsine, and 1.75 per cent. salts, consisting of carbonate and phosphate of lime, chloride of sodium, minute traces of sulphates, and sometimes a trace of ammoniacal salts. The proportions, however, in which these inorganic constituents are present, vary considerably. Lastly, the gastric juice contains a free acid, which is one of the most important components.

As it would be impossible to obtain a sufficient quantity of gastric juice for medicinal purposes from living animals, either by fistulous openings or any other method, we seek to intercept the pepsine before it passes into the stomach, and to extract it from the little tubes in which it is secreted, or at all events along which it passes on its way. For this purpose the rennet-bags of sheep are the most convenient, on account of the large supply which is always at hand; and the following process has been proposed by M. Boudault:—The rennet-bags are opened and reversed, and washed under a thin stream of water, to free them from alimentary matters, &c. The mucous membrane is then

carefully scraped off with a knife, the cells are bruised in a mortar, and digested for twelve hours in distilled water. The liquid is then filtered, and neutral acetate of lead is added, which precipitates peptate of lead. This precipitate is collected and decomposed by means of sulphuretted hydrogen, pepsine is thus liberated in solution, and is separated from the insoluble sulphide of lead by filtration. This liquid represents a neutral gastric juice. It is, however, necessary that it should be acid, and for this purpose lactic acid is added until the liquid exhibits the same degree of acidity as a specimen of gastric juice, obtained from the stomach of a dog by means of a fistulous opening. The reason why lactic acid is selected for this purpose will be shown below. If the artificial gastric juice thus obtained, be evaporated to dryness at a gentle temperature (it should not exceed  $100^{\circ}$  Fah.), a gummy mass is obtained, which attracts moisture from the air, and is altogether a very unfit article either for sale or administration. In order to reduce it to powder, M. Boudault simply evaporates his artificial gastric juice to a syrupy consistence, and to this he adds dried starch in such proportion that one gramme (15 grains) shall be in a position to digest four grammes of dry fibrine, when the two are submitted together in the presence of water to the temperature of the human body.

The substance thus produced is a fawn-colored powder, cohering somewhat together, and possessing a peculiar taste and odor. It yields to water the lactic acid and the pepsine, producing a solution of a yellowish tint, with the color, odor, and taste of gastric juice.

A solution of pepsine—that is to say, the neutral artificial gastric juice—presents the following reactions:—Salts of lead and mercury give rise to precipitates, which, when decomposed by sulphuretted hydrogen, reproduce the pepsine with its physiological properties. Tannin likewise precipitates pepsine, but the precipitate has no power whatever of digesting fibrine. Rectified spirit precipitates the pepsine from its solution. This precipitate is soluble in water. Absolute alcohol dehydrates pepsine, and destroys, or at all events greatly diminishes its digestive power. One property, however, which pepsine possesses, which is very characteristic, and which is a fruitful source of failure in its preparation, is, that at the temperature of about  $120^{\circ}$  Fah.,

its solution becomes slightly turbid, and loses entirely its digestive properties.

There has been considerable difference of opinion with regard to the nature of the acid in the natural gastric juice; some Chemists assert, that the acidity is mainly due to hydrochloric acid, some are advocates for phosphoric acid, others again for lactic acid, but it is universally admitted that the gastric juice must be acid, to produce its physiological effects, and that lactic acid is always present to a greater or less extent. Lehmann found, that when gastric juice is distilled, the first portions which passed over were free from hydrochloric acid, but as the liquid became more concentrated, hydrochloric acid was obtained; and this he ascribed to the property possessed by concentrated lactic acid of decomposing the compounds of the strongest acids, and in this case to the decomposition of the chloride of sodium.

In order to determine this question, M. Boudault made the following experiments. He first wished to ascertain whether the gastric juice, as it issued from the mucous membrane, was acid or not. With this view, the rennet-bags were carefully cleaned and washed as long as any acid reaction was manifested to litmus paper; the cells were then bruised, and treated with cold distilled water; and in this way a perfectly neutral fluid was obtained. This fluid did *not* possess the power of digesting fibrine at the temperature of the body, but on the addition of a little lactic acid a complete digestion was obtained.

Now it is well known that pepsine has the property of converting glucose or grape sugar into lactic acid, and when we consider that the saliva can by its action convert amylaceous substances into glucose, and that pepsine determines the conversion of glucose into lactic acid, we have a very fair explanation of the acidity of the fluid found in the stomach.

Boudault found that a mixture of glucose, neutral pepsine, and fibrine, yielded complete digestion after twelve hours. The process of digestion did not, however, commence until the liquid had assumed a strongly acid reaction. I will not, however, say that lactic acid is the only acid which is capable of playing this part; on the contrary, hydrochloric and acetic acids yield perfect digestions, but not with the same rapidity as lactic acid.

From a number of digestive experiments carefully performed,

Boudault found that the pepsine obtained from herbivorous animals is identical in its properties with that obtained from the carnivora, and may be substituted for it, so far at least as the digestive functions are concerned.

The employment of an artificial digestive agent is not new in medicine. The liquid obtained by treating rennet with water, acidified with some acid, has been given with success, but it has never been much used—probably in consequence of the disagreeable nature of the dose; but now that we have the means placed before us in an elegant form, it is no longer a matter of difficulty. The details and the cases where it may be employed will suggest themselves to every medical man. There are at present four preparations of pepsine in use—namely, No. 1, acidified with lactic acid; No. 2, which contains in addition 1 per cent. hydrochlorate of morphia; No. 3, containing  $\frac{1}{4}$  per cent. strychnia; and No. 4, which contains no lactic acid, and is useful where there is an excess of acidity.

Other medicines, however, may be given in conjunction with pepsine, without in any way impairing its action; among these are subnitrate of bismuth, lactate of iron, carbonate of iron, iodide of iron, and reduced iron. Attempts have likewise been made to form a syrup of pepsine, as a more agreeable way of exhibiting this medicine; but it was found that the sugar was after some ten or twelve days converted into glucose, and finally into lactic acid. A solution of pepsine will keep any length of time, provided air be excluded; but, in the presence of air, decomposition soon sets in: and I have found that the best form to keep it in is that of a powder, as originally proposed by M. Boudault. It may be taken in this form very conveniently between two slices of bread, or in the first spoonful of soup, which, however, should not exceed the temperature of the body, the dose being about fifteen grains.

The gastric juice possesses all the characters of a diluted acid; it attacks iron filings, and decomposes the alkaline carbonates, and it appears to me that this fact would justify a much more extended use of the lactates than at present prevails, for such preparations as *ferrum radactum*, *ferri carbonas saccharatum*, *mistura ferri*, &c., must be resolved into lactates soon after they reach the stomach, and that, too, at the expense of one of the most important constituents of the gastric juice.



[Mr. Squire has notified, in letters to the *Lancet* and *Medical Gazette*, the existence of a spurious preparation of Pepsine, for distinguishing which he gives the following tests:—

True Pepsine.	Test.	False Pepsine.
Abundant precipitate (Peptate of Lead) }	.....Acetate of Lead.....	Slight cloudiness.
Abundant precipitate (Tannate of Pepsine) }	.....Tannin.....	Ditto.
Precipitates the Pepsine }	.....Alcohol.....	No effect.

The solution of true Pepsine is strongly acid to litmus, whilst the false is only so in a slight degree; but, more than all, M. Boudault's preparation does what it professes to do: fifteen grains digests its drachm of dried fibrin, while the spurious compound is entirely destitute of this property.—*Lancet*.

The most serious contamination of Pepsine is that contained in No. 3, namely, strychnia! For what purpose this is introduced we cannot imagine; but the circumstance of keeping such company is likely to cause alarm, and thus to create a prejudice unfavorable to the general introduction of Pepsine into dyspeptic society.—ED. PHARM. JOURN.].—*Lon. Pharm. Jour.*, March 2, 1857.

#### ON THE DETECTION OF STRYCHNINE IN CASES OF POISONING.

By DR. J. E. DE VRY, Lecturer on Chemistry; and E. A. VAN DER BURG, Pharmaceutical Chemist of the Rotterdam Hospital.

In the month of September, 1856, we were required by the *Juge d'Instruction* to make a chemical investigation of the contents of the body of a man, on the cause of whose death there was some suspicion of poisoning. The man having been brought to the hospital in a tetanic state, we were naturally induced to try to find strychnine in the contents of the body; but neither this nor any other poison was to be found, so that the death of this man remained unexplained.

The discordant opinions of several chemists in the famous trial of Palmer, made it necessary, for our own persuasion of the truth, to institute a series of experiments, to make out:—1st. The sensibility of the principal reagents on strychnine; 2nd. The possibility of detecting strychnine with these reagents, if the strychnine is mixed with animal substances; 3rd. If strychnine

nine can *always* be found in the corpse of an individual poisoned by it.

1st. Sensibility of the principal reagents on strychnine: *Chromate of potash or ferridcyanide of potassium and concentrated sulphuric acid.*—By these reagents  $\frac{1}{60000}$  of a grain of strychnine can be detected, if one drop of a solution, containing one grain of strychnine in 60,000 grains of water, is evaporated in a small porcelain dish on a water-bath, and the remaining substance moistened with the smallest possible quantity of pure concentrated sulphuric acid. By introducing in this solution a *very small* fragment of a crystal of bichromate of potash or ferridcyanide of potassium, and moving this fragment with a glass rod in the solution, a beautiful dark purple color is produced on every part of the surface of the porcelain that has been in contact with the acid solution, and the fragment of one of the two salts.

*Bin-iodide of potassium, and iodide of mercury and potassium.*—By a solution of one of these compounds,  $\frac{1}{60000}$  of a grain of strychnine can be detected. These reagents, like the following, possess only the ascertained sensibility, provided the drop of liquid is contained in a capillary test-tube, in which the liquid, although only a drop, forms a small column, in which the formation of a precipitate can be observed by comparison with a similar capillary tube filled with pure water, and mixed with the reagent.

*Tannic acid* reveals  $\frac{1}{25000}$  of a grain of strychnine.

*Solution of chlorine in water,*  $\frac{1}{3000}$ .

*Sulphocyanide of potassium,*  $\frac{1}{3000}$ .

*Neutral chromate of potash,*  $\frac{1}{5000}$ .

The precipitate formed by bin-iodide of potassium is brownish-red, and if dissolved in weak warm spirit, acidulated by sulphuric acid, beautiful crystals are formed of sulphate of iodo-strychnine, which polarize the light, as has been discovered by Mr. Herapath. The precipitate formed by iodide of mercury and potassium, by tannic acid, and by solution of chlorine in water, are white. This last reagent must be used in relative large quantity, and the precipitate formed by it does not appear immediately.

The precipitates formed by sulphocyanide of potassium and neutral chromate of potash are both crystalline. The color of the former is white, and the form of the crystals observed by the

microscope is very characteristic. The color of the latter is a beautiful yellow. The formation of both these precipitates is accelerated by rubbing the surface of the tube with a glass rod.

The precipitate formed by chromate of potash gets immediately a dark purple color, if moistened by concentrated sulphuric acid. *All* the other precipitates get the same color if they are dissolved in a small quantity of strong sulphuric acid, and the solution brought into contact with a fragment of a crystal of chromate of potash or ferridcyanide of potassium.

2nd. The possibility of detecting strychnine, if mixed or combined with animal substances.

In all the following experiments, the method of Professor Stas was used. This method, by which all organic basic poisons can be detected, consists in treating the animal substance, which is supposed to contain a poison, with spirit of wine, acidulated by pure oxalic or tartaric acid. The tincture, after having been filtered, is evaporated at a gentle heat on a water-bath, and the remaining substance dissolved in anhydrous alcohol. This solution is filtered, and again evaporated, and the remaining substance dissolved in water. The watery solution, after having been filtered and partly evaporated, is saturated with bicarbonate of soda, and afterwards repeatedly agitated with ether, which is made alkaline by a small quantity of caustic potash or soda. If there is any basic organic poison present in the animal substance under examination, it will be obtained by evaporating the ethereal solution, and may be afterwards tested by several reagents to find out its nature.

*1st Experiment.*—A solution of  $\frac{1}{4}$  of a grain of strychnine mixed with 6 ounces of fresh meat. The poisoned meat, treated as mentioned, afforded small crystals of strychnine, of which the identity was proved by the reagents mentioned.

*2nd Experiment.*—The white and yellow of one egg were mixed with  $\frac{1}{4}$  of a grain of strychnine, and this mixture coagulated by the heat of boiling water. The coagulum being treated according to Stas's method, *almost the whole quantity* of the strychnine was recovered in white crystals.

*3rd Experiment.*—The urine of 24 hours from a patient in the hospital, to whom the physician administered every day  $\frac{1}{4}$  grain of nitrate of strychnine, was divided into two equal parts, and

one of these parts mixed with  $\frac{1}{4}$  grain of nitrate of strychnine. The two parts treated in the same way as described by Messrs. Graham and Hofmann,\* by digesting and agitating during 24 hours with animal charcoal, &c., that part in which  $\frac{1}{4}$  grain of the strychnine-salt was dissolved, afforded us crystals of strychnine, whilst we could not find the least trace in the other part.

4th Experiment.—On the 15th of September,  $\frac{1}{4}$  grain of strychnine was administered to a young dog. Twenty minutes after the introduction of the poison, its action commenced by vehement tetanic spasms, salivation, and excretion of urine, and ten minutes later the dog was dead.† The stomach, liver, gall, bladder, spleen, kidneys, intestines, and blood were taken from the body and separately examined on the 18th September, when they all were in full putrefaction. The result of this investigation was, that a comparatively large quantity of strychnine was obtained from the stomach, whilst no one of the other entrails contained the least trace of this poison.

3rd. Can strychnine *always* be found in the corpse of an individual poisoned by it?

After we had proved that the least trace of strychnine could be detected if it was really present, we desired to get the conviction if poisoning by strychnine could *always* be proved by the aid of chemistry. The following experiments were executed with a view of determining this point:—

1st Experiment.—A middle-sized dog was poisoned by introducing a solution of nitrate of strychnine in a superficial wound. Immediately after death, 4 ounces of the blood were treated according to Stas's method, but not the least trace of strychnine could be detected.

2nd Experiment.—On the 26th September we administered to a small dog weighing about 8 pounds, at 10 o'clock in the

\* *Annalen der Chemie und Pharmacie*, Bd. 83, S. 39.

† The same dose of poison, mixed with half an ounce of animal fat, was administered to another dog of somewhat larger size, for the purpose of testing the assertion of Dr. Pindell, published some time ago in the *American Journal of Pharmacy*, that fat would neutralize the tonic effect of strychnine. The result, however, proved fatal to the animal, which died an hour and a quarter after the ingestion of the poison.

In this experiment, the admixture of fat to the poison had no other effect than to retard (and not to neutralize) its mortal effect.

morning,  $\frac{1}{30}$  grain of strychnine mixed with  $\frac{1}{15}$  grain of tartrate of antimony and potash. This dose was repeated twice on the following day, at 9 o'clock in the morning, and at 4 o'clock in the afternoon, without any symptom. On the following day the dose was repeated at 9 o'clock, and again at 12 o'clock in the morning, and at 1 o'clock the dog had a violent attack of tetanus, accompanied by salivation and ejection of urine. This attack lasted some minutes, and was soon followed by a second, which was still more violent. At 3 o'clock the dog got a third, and at 8 o'clock a fourth dose of poison, each of which was followed by an attack of tetanus, one hour after the introduction of the poison. On the 30th of September, the situation of the dog was much better compared with that of the preceding evening. At 10, and again at 12 o'clock, a dose of poison was administered, which doses were followed now and then by spasmodic contractions, whilst it appeared that the irritability of the nerves was much increased, for the dog jumped up or trembled at the least noise. At 2 o'clock in the afternoon a third dose of poison was given, which was followed at half-past 2 and half-past 3 o'clock by attacks of tetanus, the latter lasting ten minutes. The fourth dose was given at half-past 5 o'clock. One hour later the dog got the most vehement attack of tetanus, accompanied by salivation and ejection of urine and fæces, which lasted a quarter of an hour, and terminated by the death of the animal. This death was caused by a chronic poisoning, begun on the 26th of September, and terminated on the 30th of September, in which lapse of time the dog got no more than  $\frac{14}{30}$ ths of a grain of strychnine, and  $\frac{28}{30}$ ths of a grain of tartrate of antimony and potash, which small dose of poison caused seven attacks of tetanus. After each attack the widely-extended hind feet were much stiffer than the fore feet.

The *post-mortem* examination of the body, which was very carefully performed by the distinguished Assistant-Physician of the Rotterdam Hospital, Dr. Schmidt, proved that there was nothing abnormal to be found which could even lead to the suspicion that death had been caused by the administration of a poison. The chemical analysis of all the parts of the body led to the same negative conclusion, for not the least trace of strychnine could be detected, notwithstanding the great sensibility of our reagents which was proved in the former experiments.



From the alleged facts we may be justified in making the following

## CONCLUSIONS.

1. That the method which we pursued for detecting strychnine was adapted to discover the least trace of the poison, for even only  $\frac{1}{60000}$  of a grain could be detected.

2. That even when the strychnine is combined with albuminous matter, nevertheless, the *whole* quantity can be separated by the method of Stas, if properly conducted.

3. That if death has been caused by strychnine, this poison can be detected in the body, provided it has been administered in a quantity *more than sufficient* to cause death.

4. That if the poisoning by strychnine has been chronic, and has resulted from a quantity not greater than just necessary to cause death, the cause of this death *cannot be proved*, either by the *post-mortem* examination of the body, or by a chemical investigation of the intestines.

5. That it appears to be highly probable that that part of the strychnine which acts mortally is decomposed in the living body.

6. That the urine of patients who take strychnine or its salts as a medicine, contains not a trace of this poison.

Rotterdam, 8th Jan. 1857.<sup>1</sup>

Mr. Redwood said that the results described in this paper differed from those which had been obtained by other Chemists under similar circumstances. Several Chemists had detected strychnine in the urine after its administration by the stomach.

Mr. Rodgers (Lecturer on Chemistry at St. George's School of Medicine) observed, that he had paid especial attention to the subject of the detection of poisons, and particularly of strychnine, and that the results and conclusions of the authors of the paper just read, were at total variance with his own and that of Mr. Girdwood, with whom he had made an extensive series of experiments, the results of which and the processes adopted, had already been made public. He did not consider that the process adopted by the authors was of sufficient delicacy to extract strychnine from the blood and tissues of the body, a view that was confirmed by the fact that they had failed to obtain evidence of the strychnine in their experiments, where half a grain of

strychnine was administered to a young dog, in any other analysis beyond the contents of the stomach, and had utterly failed to obtain any indication of its presence in the urine of patients taking strychnine, while Drs. Wrightson, Letheby, Ogle and Mr. Herapath, as well as himself and Mr. Girdwood, had never experienced the slightest difficulty in separating strychnine from all parts of fluids of the body subjected to analysis.

He further observed, that he did not consider the manner of their applying the test of sufficient delicacy to detect the minute quantities of strychnine that could be obtained from the tissues and fluids of the body, it being frequently necessary in such cases to apply sulphuric acid containing a minute quantity of chromic acid, by means of a glass pen, to obtain the distinctive color; the conclusions derived from his own researches were, that strychnine is not decomposed in the body, and can always be discovered if a proper method of analysis is employed. Should any Member of the Society wish to repeat the author's experiments, he would be happy to show him the methods of analysis adopted by himself and Mr. Girdwood, and was perfectly certain that strychnine would be readily found.

Mr. Bastick thought that Dr. De Vry's question had not been answered by the two last speakers, namely, can strychnine be detected in the urine of a patient who does not die from its effects?

Mr. Rodgers said he had detected it in such cases.

Mr. Redwood thought it of the highest importance, if Dr. De Vry's conclusions were erroneous, that they should be corrected as early as possible. He concurred with Mr. Rodgers in thinking that the method described in Dr. De Vry's paper for applying the test for strychnine was not the most delicate method. He had found a solution consisting of one grain of chromic acid in 500 grains of oil of vitriol, the best form in which to apply the test where quantities of strychnine to be detected were very minute. Failure often arose from the use of too much of the oxidizing agent, in which case the effect was so rapid, that the eye failed to follow it.—*London Pharm. Journ., March, 1857.*

## Minutes of the Philadelphia College of Pharmacy.

At a meeting of the College held at the Hall, Third month, 30th, 1857. The President in the chair.

After the reading and adoption of the minutes of the last meeting, the minutes of the Board of Trustees for the last six months were read by A. B. Taylor, Secretary of the Board. Edward H. Hance has been elected a resident member by the Board, and Wilson H. Pile being recommended to the College for election, a ballot was held, T. Morris Perot acting as teller, and he was unanimously elected a resident member.

The Annual Commencement for conferring degrees was held on the 19th inst., and the following graduates have, by vote of the Board of Trustees, received the honors of the College. The address was delivered by Prof. R. P. Thomas.

### *Graduating Class.*

Baker, James R.	Pennsylvania,
Bringham, Ferris,	Delaware,
Brower, Noah B.	Pennsylvania,
Bunn, Jonathan H.	New Jersey,
Caldwell, James M.	Pennsylvania,
Campbell, Samuel,	Pennsylvania,
Dancy, F. B.	Mississippi,
De Choudens, Joseph F.	France,
Fleming, William S.	Pennsylvania,
Hancock, Charles W.	Pennsylvania,
Hughes, C. Collin,	Pennsylvania,
Kaufman, John F.	Pennsylvania,
McConaughy, Albert D.	Pennsylvania,
McMullen, Jacob B.	Pennsylvania,
Massenburg, T. L.	Virginia,
Mercein, James R.	Pennsylvania,
Mercer, John T.	Ohio,
Neal, Leander,	Pennsylvania,
Richardson, Joseph G.	Pennsylvania,
Rohrbacher, Frederick,	Pennsylvania,
Schurk, Peter, Jr.	Iowa,
Seuret, J. Pedro,	Cuba,
Steen, James H.	Pennsylvania,
Taylor, Horace B.	Pennsylvania,
Wetherill, J. Bloomfield,	Pennsylvania,
Young, Joseph,	Pennsylvania,
Zieber, Jacob B.	Pennsylvania,

### *Subject of Thesis.*

Radix Zedoaria.
Lapis Calaminaris.
Tinctures.
Arnica Montana.
Strychnos Ignatia.
Lycopus Virginicus.
Malambo or Matias Bark.
Liquor Tartari Boraxati.
Strychnos Ignatia.
True position of the Druggist.
Colchici Semen.
Essential Oils.
Juglans Cinerea.
Cytisus Scoparius.
Rubus Villosus.
Cornus Sericea.
Asclepias Tuberosa.
Comptonia Asplenifolia.
Veratrum Viride.
Pulvis Sennæ Compositus.
Matico.
Adiantum Pedatum.
Spigelia Marilandica.
Capsicum.
Barosma Crenata.
Rhus Toxicodendron.
Stillingia Sylvatica.

The Report of the Publication Committee was next read as follows :—

"The Publishing Committee report, that the American Journal of Pharmacy has been regularly issued since the last Annual Meeting. The interest manifested in it by readers and contributors appears to be unabated. In accordance with a resolution of the College, adopted at the last Annual Meeting, the Journal has been furnished gratuitously to those

members who were previously subscribers, and to such other members as have applied for it; a notice requesting all those who were members and who had complied with the resolution by having paid their annual contribution, having been inserted in the number following the passage of the resolution.

"The gradual accumulation of the stock of back volumes having become inconvenient in the Library room, it was suggested to throw a floor across the upper portion of the well of the staircase, and gain access to it from the upper lecture room. The Board having granted the right to proceed, the Committee have had the improvement carried out, at an expense of about twenty-five dollars. The space thus obtained is a room 6½ feet high, 6½ feet wide and 12 feet long, amply sufficient for the purpose intended, two sides having been shelved to hold the volumes."

CHARLES ELLIS,  
WM. PROCTER, JR.,  
EDW. PARRISH,  
ROBERT BRIDGES,  
A. B. TAYLOR,

March 30, 1857.

*Publishing Committee.*

A statement of the financial concerns of the Committee accompanied the Report.

The Sinking Fund Committee made a report showing that they have during the past year extinguished one share of the College Loan, and have in hand \$90 75.

The Latin Label Committee reported their operations for the past year, and in view of the small stock of yellow shop labels on hand, they were encouraged to publish an edition of yellow labels somewhat improved on the present, and also a smaller set for physician's offices; should the bronzed labels be sold before the next meeting, the Committee is authorized to issue another edition of these.

The Corresponding Secretary presented a pamphlet sent the College by M. Henri Buiguet, Secretary of the Society of Pharmacy, Paris, on a new process for estimating carbonic acid in mineral water, &c., which was accepted.

The College being reminded that the Annual Meeting of the American Pharmaceutical Association will occur before the next meeting of the College, the following, on motion of T. P. James, was unanimously adopted:

*Resolved*, That we cordially invite the American Pharmaceutical Association to hold its sessions in the College Hall, and request the Board of Trustees to take timely action in order to secure the reception and proper accommodation of the members while in our city.

Information having been received that the Board of Trade of this city is about enlarging its membership by delegates from all the principal branches of trade and manufactures, the following Committee was ap-

pointed by this College to consider whether and in what way we can co-operate in the movement:—Charles Ellis, chairman, S. F. Troth, T. P. James, Edw. Parrish, C. Bullock and J. C. Savery.

The annual election was held, and resulted in the choice of the following officers for the ensuing year:

*President.*—CHARLES ELLIS.

*1st Vice President.*—S. F. Troth.

*2d Vice President.*—Dillwyn Parrish.

*Recording Secretary.*—Edward Parrish.

*Corresponding Secretary.*—Wm. Procter, Jr.

*Treasurer.*—Ambrose Smith.

*Eight members of the Board of Trustees.*

Dr. R. Bridges,	Wm. Hodgson, Jr.,
D. S. Jones,	J. C. Savery,
S. N. James,	T. S. Weigand,
S. S. Bunting,	F. C. Hill.

*Delegates to the American Pharmaceutical Association.*

D. Parrish,	Ambrose Smith,
Wm. Procter, Jr.,	Charles Bullock,
	T. S. Weigand.

*Committee on Sinking Fund.*

S. F. Troth,	Edward Parrish,
	Ambrose Smith.

*Publication Committee.*

Charles Ellis,	Dr. R. Bridges,
Wm. Procter, Jr.,	Edw. Parrish,
	A. B. Taylor,

Then, on motion, adjourned.

EDW. PARRISH, Secretary.

### Minutes of the Maryland College of Pharmacy.

Baltimore, October 2d, 1856.

The College met and was called to order by the President at the usual hour; twenty members present. The minutes of the last meeting were read and approved of.

Mr. Thompson read a paper on Tincture of Chloride of Iron, which was ordered to be placed on file. Mr. Roberts, offered for the consideration of the College, a formula for preparing Fluid Extract of Valerian, which was ordered to be entered on the minutes; it is as follows:—

Take of Valerian in coarse powder	half a pound;
Ether	four ounces.
Alcohol	twelve ounces.
Carbonate of Soda	half an ounce.
Diluted Alcohol	a sufficient quantity.



"Mix the Ether, Alcohol and Valerian; macerate for several days in a close vessel, then transfer to a displacement filter and pour on alcohol until you recover the quantity of menstruum first used. Evaporate, without the application of heat, to eight ounces. Upon the surface of the residue in the filter, sprinkle the carbonate of soda in fine powder, and pour on diluted alcohol until it passes nearly pure; evaporate the liquid thus obtained to eight ounces and add to the first product." A sample of the fluid extract prepared as above was exhibited by Mr. Roberts; which is of dark color, clear, of uniform consistence, and seems to possess the active properties of the root in an eminent degree.

Mr. Sharp, in behalf of the different committees appointed by the Druggists and Pharmacutists of the city, to make arrangements for the late Pharmaceutical dinner, presented the College with the sum of sixty-three dollars and twenty-five cents, it being the surplus after defraying all the expenses of the entertainment, which was accepted unanimously, with the thanks of the College.

No other business having been brought forward, the College adjourned.

*Baltimore, November 6th, 1856.*

The College met, and in absence of the President the meeting was called to order by the First Vice President, Mr. Grahame.

Mr. Thompson called the attention of the College to the specific gravity of the Commercial Inodorous Glycerin of American Manufacture. The standard sp. gr., given by the United States Pharmacopœia is 1.250, that of the Dublin 1.260. The sp. gr. of the sample he examined was 1.138 at 60° Fahrenheit. Four fluid ounces, weighing 2080 grains was reduced by evaporation over a water bath to 990 grains and the sp. gr. increased to 1.264; rather over the Dublin standard. The four fluid ounces he operated upon was reduced to less than two fluid ounces. On motion of Mr. Moore, the remarks of Mr. T. were ordered to be placed on the minutes, and he was requested to communicate with the Editor of the American Journal of Pharmacy on the subject.

A donation of specimens of Chemicals, &c., manufactured by Messrs. Rosengarten & Sons of Philadelphia, was received from those gentlemen, through Messrs. Thomsen, Woods and Block. The articles are forty-four in number, and are handsomely and tastefully put up. On motion of Mr. Phillips, the Secretary was directed to acknowledge their receipt with the thanks of the College, and also to return thanks to Messrs. Thomsen, Woods and Block, for their agency in the matter.

On motion of Mr. Moore, the Secretary was directed to express the thanks of the College to Mr. E. S. Wayne, of Cincinnati, for his very handsome donation of specimens of vegetable alkaloids, &c.

Mr. Moore gave notice of an amendment to the By-Laws which he proposes to offer at the December meeting; he proposes to add a new section to Law 6, as follows:—

*Section 10.* "All wholesale druggists may become contributing members, by a vote of a majority of the members present at any stated meeting of the College, on payment of an annual contribution of five dollars. They shall be entitled to all the privileges of Honorary Members."

After which, on motion the College adjourned.

#### MINUTES OF THE BOARD OF TRUSTEES.

The Board met after the adjournment of the College, six members present. Mr. Baxley offered the following resolution which was unanimously adopted.

*Resolved* That students of good moral character, who have been engaged in the Drug and Apothecary business over four years before the commencement of the present course of lectures, may graduate at its close upon passing the requisite examination. Adjourned.

#### MINUTES OF THE COLLEGE.

*Baltimore, December 4th, 1856.*

The College met, and was called to order by the President. Twelve members present. On motion of Mr. Moore, the amendment to the By-Laws proposed at the November meeting was unanimously adopted. The Secretary was ordered to notify the members that their annual contribution will be due at the January meeting. Adjourned.

#### MINUTES OF THE BOARD OF TRUSTEES.

*Baltimore, December 27th, 1856.*

The Board was called to order by the President. Seven members present. The following gentlemen were nominated for membership and duly elected; viz:—David F. Ricketts, Wm. L. Jung, Edward Cauffman and Thomas Edward Kirby. After which the Board adjourned.

W. S. THOMPSON, Secretary.

#### MINUTES OF THE COLLEGE.

*Baltimore, January 1st, 1857.*

The College met and was called to order by the President. The Secretary being absent, Mr. Phillips was appointed Secretary pro tem.

The Treasurer presented his Semi-Annual Statement ending December 31st, 1856, as follows:—

Balance on hand as per July report, . . .	\$138.53
Amount received from July 1st to December 31st,	160.75

Total,	\$299.28
Disbursements for the same period, per vouchers,	296.02

Balance in hand December 31st, 1856, . . .	\$3.26
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On motion a Committee of three was appointed to examine the Treasurer's account, and to report thereupon at the next meeting.

Mr. Baxley nominated for contributing members Messrs. J. Jacob Thomsen, G. Davidge Woods, John Block and Solomon King, who were unanimously elected.

Messrs. Sharp and Moore were nominated for Examiners, and upon ballot were elected.

This being the regular meeting for the election of two Vice Presidents and two of the Board of Examiners, Mr. I. J. Grahame was nominated for the first, and Messrs. J. W. Barry and L. Phillips for the second, Vice President. Upon the ballot being taken, Messrs. Grahame and Phillips were elected.

On motion of Mr. Baxley the College adjourned to Thursday, 15th inst. at 3½ o'clock, P. M.

L. PHILLIPS, Sec. pro tem.

#### MINUTES OF THE BOARD OF TRUSTEES.

*Baltimore, January 1st, 1857.*

After the adjournment of the College, the Board of Trustees met, five members present. Upon a favorable report from the Board of Examiners, Mr. Wm. T. Ely was elected a member of the College. Adjourned.

#### MINUTES OF THE COLLEGE.

*Baltimore, January 15th, 1857.*

The College met by adjournment. In absence of the President, the first Vice President took the chair, and called the meeting to order.

Mr. Phillips offered the following resolution, which after some discussion was adopted.

*Resolved*, That a Committee of three be appointed, who shall take into consideration and report at our next meeting, the best means and plans for carrying out the objects of this College, in regard to essays, discussions and all subjects bearing upon the profession of Pharmacy. Messrs. Phillips, Andrews and Lemmon were named as the Committee.

Mr. Grahame exhibited a sample of Syrup of Poppies prepared with diluted alcohol as the menstruum, as recommended by Prof. Wood in the United States Dispensatory; which seems to possess some advantage over the processes of the London and Edinburg Pharmacopœias. Adjourned.

#### MINUTES OF THE BOARD OF TRUSTEES.

*Baltimore, January 23d, 1857.*

The Board met upon call of the Chairman. Present all the members. Mr. Grahame stated that the object of the meeting was to fix a time for the candidates for graduation to present their inaugural essays, when upon motion the time was limited to 25th February ensuing.

Mr. Phillips offered the following resolution, which was adopted:

*Resolved*, That the Professors be requested to affix their signatures and name of branch to each Diploma granted by the Board of Trustees,

Mr. Sharp offered the following resolution, which was adopted:

*Resolved*, That a committee be appointed to investigate the recent cases of poisoning by Cyanide of Potassium in mistake for Chlorate of Potassa.

On motion of Mr. Baxley, Messrs. Andrews, Sharp, and Phillips were appointed as the committee.

Mr. Richard Willis having been nominated for membership, was duly elected. Adjourned.

#### MINUTES OF THE COLLEGE.—SPECIAL MEETING.

*Baltimore, January 30th, 1857.*

The College met upon call of the President. Thirteen members present; the President in the chair. After calling the meeting to order, the President stated that the College was called together to hear and act upon a report of a Committee appointed at the meeting of the Board of Trustees, on the 23d inst., to investigate the circumstances of the late fatal mistake made by the proprietor of a drug store in this city.

The Committee then presented their report, which was adopted by the College.\*

#### MINUTES OF THE COLLEGE.

*Baltimore, February 5th, 1857.*

The College met, and was called to order by the President. Fifteen members present.

The Committee appointed at the meeting of 15th of January "to take into consideration and report the best means and plans for carrying out the objects of the College, &c.," offered the following report and resolutions, which were adopted after some discussion:

The undersigned, to whom was referred the resolutions of Mr. Phillips, to consider and report the best means and plans for promoting the objects of the College, in regard to essays, discussions and subjects bearing upon the profession of Pharmacy, respectfully submit, that for the present they consider it inexpedient to propose plans for meeting the entire objects of the resolution, but conceive that the revision of the processes for the preparations of the U. S. Pharmacopœia is desirable to be entered into by this College; they therefore offer the following resolution:

*Resolved*, That at each stated meeting of the College, the Chairman shall submit a list of preparations of the U. S. Pharmacopœia, and each member shall select one or more subjects and report thereon. The member, upon the acceptance of the subject assigned to him, shall make as minute examinations of it as possible, in everything of interest, as to its sensible properties, constituents, solubility in different menstrua; its tendency to change or decomposition, and appearance as made by different formulæ, as

\*The Report and the resolutions appended to it were published in the March number of this Journal, page 189.

they may have come under his notice, and report thereon in writing at the next stated meeting, if possible.

If, in the examination of the processes of the U. S. Pharmacopoeia, he shall conceive that its mode of preparation is preferable, he shall compare it with the other processes for the same preparation, which have been employed or suggested and come to his knowledge, and detail its advantages, &c.

If he shall adopt the formula of either of the British or Continental European Pharmacopoeias for his subject, he shall state his reasons therefor, and if he shall suggest a process of his own, or adopt the formula recommended by another, which he conceives to be preferable, he shall detail such process or suggestions for processes in full, with his reasons for his preference.

All precaution should be taken when following the formula of the U. S. or other Pharmacopoeias, according to directions, in the employment of temperature, evaporation, percolation, or maceration, density and state of mechanical division, and menstrua of proper strength, and also in the processes suggested in the place of those of the U. S. Pharmacopoeia.

He shall render a written report and submit a specimen of his preparation, properly labelled and marked (so as to be easily referred to on the file) which shall be the property of the College.

Submitted by

L. PHILLIPS,

In behalf of the Committee.

Mr. Moore offered the following resolution, which was adopted.

*Resolved*, That a list of the Officers and active members of the College be published by the Secretary, in the American and Sun Newspapers, immediately succeeding the January and July meeting, with a notice of the election of officers.

Messrs. Wm. H. Brown and A. Vogeler, having been nominated, were unanimously elected contributing members. Adjourned.

#### MINUTES OF THE BOARD OF TRUSTEES.

*Baltimore, February 5th, 1857.*

The Board met, and was called to order by the President, all the members present. Mr. Sharp nominated Mr. Lloyd Dorsay for membership, who was unanimously elected.

On motion of Mr. Moore, the Treasurer was authorized to employ a collector to call on those members who have not paid their annual contributions.

The Curator was authorised to confer with Professor Steiner in relation to the cost of Chemical Apparatus, purchased by him for the use of the College.

The Curator was also ordered to procure a copy of the U. S. Dispensatory, and a copy of Fowne's Manual of Chemistry. Adjourned.



*Baltimore, February 17th, 1857.*

The Board met at 4 o'clock, P. M. All the members present; the President in the Chair.

Professor Grahame stated that the object of the meeting was to fix upon a day for the examination of candidates for graduation, and on his motion the day fixed upon was Monday, 2d March.

On motion of Mr. Roberts, the Board resolved itself into a Committee of the whole to examine the candidates in conjunction with the Professors.

On motion, the Curator was authorized to engage the large room of the Masonic Hall, for the Commencement, and to confer with the Professors in regard to the time of holding, and to make the proper arrangement for the Commencement.

On motion of Mr. Phillips, the President was authorised to deliver the diplomas with appropriate remarks to the graduates. Adjourned.

#### MINUTES OF THE COLLEGE.

*Baltimore, March 5th, 1857.*

The College met, and was called to order by the President, fourteen members present.

Mr. Sharp read a paper on Syrup and Spiced Syrup of Rhubarb, and exhibited specimens of the preparations, which were deposited in the Cabinet of the College and the paper was ordered to be placed on file.

Mr. Roberts read a paper on Vinous Tinctures, Syrup of Ipecacuanha, and Acetous Syrup of Ipecacuanha, and exhibited specimens of the preparations. The paper was ordered to be placed on file, and the specimens were deposited in the Cabinet of the College.

Professor Grahame read a paper on Savin Ointment, and exhibited a specimen of the Ointment, but requested permission to withdraw the paper for the purpose of re-writing it; which was granted.

Mr. Phillips offered the following resolutions, which were adopted:

*Resolved*, That a committee of three be appointed by the President, to take charge of all communications in reference to revision of the Pharmacopoeia.

*Resolved*, That any communication on the revision of the Pharmacopoeia may be open for debate at any stated meeting of the College, subsequently to the one at which it is offered.

The Chairman appointed the following gentlemen as the committee proposed by Mr. Phillips' resolution: viz. Messrs. Phillips, Roberts and Lemmon.

Mr. Phillips then moved that all previous communications in reference to preparations of the Pharmacopoeia be handed over to the Committee by the Secretary, and that the Committee be authorized to procure a book in which to register all such communications. The motion was concurred in.

The Chairman, in behalf of the Board of Trustees, announced the following gentlemen as graduates of the College, viz.

Louis Dobme, of Maryland,	Thesis,	Valerianic Acid.
E. Walton Russell, N. Hampshire,	"	Displacement.
Joseph C. O'Brien, Maryland,	"	Sanguinaria Canadense.
J. Emory Weatherby, New Jersey,	"	Pharmacy.

On motion of Mr. Moore, the Chairman appointed the following gentlemen to act as a committee of reception in conjunction with the students, at the Commencement on Friday evening next, 6th inst. viz. Messrs. Dorsay, Woods, Jennings, Willis and Jung.

No other business having been brought forward, the College adjourned.

W. S. THOMPSON, Secretary.

## Editorial Department.

**NEXT MEETING OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.**—The next meeting of the Association convenes in this city on the 8th of September of the current year. As yet we have received no official notice from the President for publication, but in order to remind the members and others of the rapid approach of the time of meeting this notice has been introduced.

As there are a number of committees on important subjects to report, it is hoped that many pharmacutists and druggists having business in Philadelphia or New York will find it convenient to attend the meeting and participate in its proceedings. All who have objects of interest in chemistry, materia medica or pharmacy, or may have made new observation pertaining to pharmacy, are encouraged to bring them to the meeting. The prospect is fair for having a numerous and interesting gathering.

**RARE SPECIMENS OF THE MATERIA MEDICA.**—Since our last issue we have been gratified by the reception of a box of interesting and rare specimens of the materia medica, mostly of East Indian origin, from Mr. Daniel Hanbury of London, who has also contributed a paper to this number on Malambo Bark. The following is a list of the contents of the box, viz:

### Cortex Malambo.

- " Copalchi, quilled, Pereira, *Elem. of Mat. Med.* Ed. 3, vol. ii. p. 1284.
- " Copalchi, corky, from San Blas, described in *Pharm. Journ. and Trans.* vol. ix. p. 463.
- " Winteranus, of the English shops. Origin unknown.
- " Winteranus Mexicanus (*? Drimys Mexicana* De C.; *D. Winteri* Forst.)
- " Alyxie (Alyxia Stellata, Roxb.)
- " Thymiamatis, or Storax bark. Pereira, *Elem. of Mat. Med.* Ed. 3, vol. ii. p. 1518.

### Brazilian Cinnamon.

- Cardamoms, Korarima, Pereira, *Elem. of Mat. Med.* Ed. 3, vol. ii. p. 1136, fig. 245, 246, 247.
- " Round or cluster, *Amomum cardamomum* L.
- " Ovoid China, *Pharm. Journ. and Trans.* vol. xiv. p. 419.
- " Galanga. *Alpinia Galanga* Willd. *Pharm. Journ. and Trans.* vol. xiv. p. 420.
- " Bitter-seeded, *Pharm. Journ. and Trans.* vol. xiv. p. 418.
- " Ceylon, *Elettaria Major*, Smith.
- Leaves of *Globularia Algyptum* L. Wild senna C. Martius in *Pharm. Journ. and Trans.* vol. xvi. p. 426.
- Flowerbuds of *Calysaccion longifolium* Wight. vide *ibid.* vol. x. p. 449, 597; vol. xii. p. 62.
- Prepared Coffee leaves, from Sumatra. *Pharm. Journ. and Trans.* vol. xiii. p. 207.
- Wood of *Coscinium fenistratum* Colebr. *Calumba wood*, *ibid.* vol. x. p. 321, vol. xii. p. 185.
- Savanilla Rhatany, *ibid.* vol. xvi. p. 29.
- Bokhara Galls, *Pharm. Journ. and Trans.* vol. iii. 386.
- Bush Tea of the Cape of Good Hope. *Cyclopia latifolia* De C. *ibid.* vol. xviii. p. 172.
- Fruits of *Euphoria Longan* Lam., from China.
- Shea Butter, *Bassia Parkii* G. Don. West Africa.
- Mecca Balsam, genuine, sent from Constantinople to the Great Exhibition of 1851.
- Strasburg Turpentine; Terebinthina Argentoratensis; *Pinus picea* L.
- Burgundy Pitch, genuine, } from *Abies Excelsa* De C.
- Gum Thus, " }
- Yenice Turpentine, *Larix Europea* De C.
- Scammony, very fine.
- Wood oil, from Moulmein. *Pharm. Journ. and Trans.* vol. xv. p. 321.
- Penghawar Djambi, *ibid.* xvi. 278.

**IODINE WATER.**—In the March number of this Journal, we took occasion to notice a liquid introduced to the public under the name of "Liquid Iodine," a bottle of which had been sent to us for examination by the proprietors, who claimed it to be a solution of iodine in pure water of the strength of half a grain to the fluid ounce; and to possess curative powers exceeding any other preparation of iodine. In preparing the notice we first tested the strength of the solution, and then remarked on the extraordinary merit it was alleged to possess.

Since then we have received the following communication from the proprietors, and although we feel disinclined to occupy so much space with so little profit to our readers, yet, inasmuch as we inadvertently did some injustice to the specimen sent to us, as will be explained in the sequel, we will insert the letter in full.

No. 3 Second Avenue,  
New York, March 16th, 1857. }

MR. WM. PROCTER, JR., Editor American Journal of Pharmacy:

SIR,—The March number of your "Journal" contains some editorial remarks upon the subject of "Anders' Liquid Iodine." We are the proprietors of that well known preparation, and feel it due both to ourselves and the public, to correct the errors into which, it is evident from the tenor of your observations, you have inadvertently fallen. Allow us, in the first place, to reply to those observations seriatim.

You say that we claim the Liquid Iodine to be "a solution of pure iodine in water without any solvent." You italicize the last three words, and append to

them a note of exclamation in a parenthesis, thus (!): thus implying, without asserting a doubt.

Now, sir, we do claim our preparation to be, openly and unequivocally, that very desideratum in medicine, a solution of pure iodine in water, and nothing else. We have the certificates of some of the ablest analytical chemists in the country to that effect.

You also state that, "admitting the amount of iodine averred, it is most probably held in solution by traces of hydriodic acid, and not by pure water."

Dr. James R. Chilton, the distinguished Chemist of this city, contradicts you somewhat emphatically. He observes in his certificate—

"I have analyzed the 'IODINE WATER,' prepared by Dr. Anders, and find it to be a solution of pure iodine in water. It has long been a desideratum to prepare iodine so that it can be administered in its uncombined state; this preparation, by Dr. Anders, enables us to effect that object."

Prof. James C. Booth, of your city (U. S. Mint) also differs materially from you in this opinion; he observes:

"DR. HENRY ANDERS:—The sample of Iodine Water, tested by me, I find to be iodine dissolved in pure water."

We might furnish you with many more proofs equally satisfactory upon this head, but conceive it unnecessary. We are quite willing to leave you most probably in the *per contra* to positive statements of facts made by gentlemen of such standing in the world of science.

You next suggest another doubt in regard to the strength of our solution, but qualify it with the remark that "the specimen tried had been kept some time in a warm room."

Permit us, in reply, to observe that our preparation loses none of its strength whatever in a warm room. Dr. Chilton, in his analysis of it, states, "Each fluid ounce of the water contains about half a grain of iodine." Other chemists, after analysis, have certified to the same effect, and some of the Iodine Water thus tested, had been standing upon our shelves in a warm room over two years.

But your most serious charge is that of "presumption and effrontery" in us for daring to assert that, "in view of its actual composition, 'Anders' Liquid Iodine, or Pure Iodine Water,' always effects a cure" in cases of consumption, palsy, rheumatism, scrofula, liver complaints, heart diseases, and disorders arising from impurities of the blood.

It seems to us that "presumption and effrontery," if their be any in the premises, might much more readily be found in the gratuitous denial of the efficacy of our preparation by one who has never yet seen it tried, and whose view of its composition is wholly apocryphal. Our affirmation of the remedial effects of the "Liquid Iodine" is based upon the direct testimony of experience, and is corroborated by the faith of over two hundred grateful men and women, who, by its instrumentality, have been restored to perfect health.

The "absurdity," as you think proper to term it, of "supposing that this solution has more merit than Lugol's, is simply the "absurdity" of supposing that iodine dissolved in water only will exhibit more specifically the effects of that element than if dissolved in combination with potassium—an "absurdity" admitted by Lugol himself, as well as by many other medical writers—an "absurdity" admitted even by such respectable authority as the U. S. Dispensatory.

It is well known that iodine, when combined with potassium, is rarely exhibited with a satisfactory result; with some systems it disagrees altogether, and with others the consequences are strikingly mischievous, nor is the prescription improved, as you seem to suggest, by the addition of the sweet spirit of nitre. Two grains of pure iodine dissolved in one ounce of the latter may be diluted with eight ounces of water, and the iodine held in solution will be found to reach the seven-thousandth part, the remainder will chiefly be discovered in precipitation at the bottom of the vessel; a common solution of iodine in water holds just as much; of what use, then is the nitre? A quart of such a mixture would contain about two grains of iodine; the same quantity of our

"very dilute" preparation, as you denominate it, would contain from sixteen to twenty-four.

To conclude, Dr. Anders' Liquid Iodine not only professes to be, but it is a simple and scientific substitute for the combinations of iodine, without any counteracting solvent whatever. In these combinations the iodine is never wholly dissolved; when exhibited it is frequently precipitated upon the mucous membrane of the throat or the coats of the stomach, inflammation ensues, and sometimes the most fatal results follow. In "Anders' Liquid Iodine," on the contrary, the iodine is held in complete solution, and in pure water. The physician is enabled to administer it in whatever state of dilution the circumstances may demand, and the specific effects of pure iodine upon the system may be unfaillingly anticipated. These effects we have already described, and stand prepared to prove by indisputable testimony—testimony not to be overthrown by the mere doubts and cavillings of the incredulous.

Yours truly,

ANDERS & FOSDICK.

On reading the above there arose no question in our mind that the analysis given by us was a correct expression of the strength of the solution at the time it was examined; but on reflection we remembered that on the day the bottle was left with us, it was accidentally broken and a part of the contents lost, as we stated at the time to Dr. Anders' agent; the residue was put in a bottle and stopped with a cork, where it remained about five weeks before it was examined. At that time the action of the iodine on the cork was not noticed, and hence not regarded; but on the reception of Dr. Anders' note, on again examining the bottle, we found it perfectly tight, but the liquid *nearly colorless*, whilst the inner end of the cork was corroded, iodous and strongly acid when applied to litmus paper, showing that the iodine had been gradually acting on the cork, so as to form hydriodic acid, which in its turn absorbed more iodine, until nearly the whole of the latter had been abstracted from the water. On this discovery we wrote to Dr. Anders' agent requesting a fresh sample for examination, and on applying the same means of analysis, a fluid ounce of the solution yielded a fraction over half a grain (-5035 gr.). This result, whilst it corroborates the analyses of Chilton and Booth, as regards the proportion of iodine, shows a curious source of deterioration, and points to the necessity of avoiding cork stoppers in liquids containing free iodine.

In reference to the solubility of iodine in pure water, the best authorities (Gay Lussac) state it to require 7,000 times its weight of water, or one grain to an avoirdupois pound, whilst in the "iodine water" it is one grain to about 900 grains, or near eight times as strong. Now either the universally received idea of its solubility is incorrect, or the iodine in Dr. Anders' preparation is held in solution by some other agent than water.

Gmelin (Handbook, vol. ii. p. 251.) says, "A brown solution of iodine loses its color by exposure to the direct rays of the sun, either exposed, or in perfectly stopped bottles, provided some air is enclosed. This decolorized solution, if brought in contact with more iodine, acquires a permanent orange yellow tint. From this it would appear that the decolorized liquid contains hydriodic acid, which by taking up an additional quantity of iodine is converted into *hydiiodous acid*. (Gmelin.)"



Now if this statement be true, all that is necessary to make "Iodine water" is to put an excess of iodine in water and expose it in the sun, hydriodic acid will be generated, which will become a solvent for more iodine, and thus increase the strength of the solution far beyond the capacity of pure water. To test its truth, we triturated a scruple of dry resublimed iodine with twelve fluid ounces of water, enclosed it in a glass stopped bottle and placed it in the sun's rays at intervals for two days. On testing it, a fluid ounce was found to contain .4105 gr. of iodine, whereas, according to Gay Lussac, it should have retained when made first but .0642 gr.

We then added a few drops of liquid hydriodic acid to water containing iodine, when its solvent power was increased many fold. We believe, therefore, that a solution of iodine, of the strength of the so-called "Iodine Water," may be prepared by exposing water with a considerable excess of iodine to the direct rays of the sun, and that any apothecary may keep a supply, by using one of his window show bottles as a vessel for its preparation, at a cost of two cents a pint.

As regards the statements of Dr. Chilton and Prof. Booth, which Dr. Anders' considers so annihilating, we believe they were intended to prove the absence of substances having a modifying influence on the medicinal powers of iodine; and further, that, unless specially sought for, they would not be likely to detect a minute proportion of hydriodic acid. Until those gentlemen are prepared to state, over their signatures, that there is no hydriodic acid present in the "Iodine water" of Dr. Anders, we shall feel perfectly safe to remain "in the *per contra*."

We are not acquainted with the proprietors, and hence speak without personal feeling. They may be sincere in believing that they have succeeded in changing the solubility of iodine in water, and self deceived in regard to the superlative merits they claim for their preparation; such instances sometimes occur; nevertheless, we cannot withdraw one tittle of our averment, that a declaration that this, or any other preparation, "is a complete and certain cure for consumption, palsy, rheumatism, scrofula, liver complaints, heart diseases, &c.," and that "it always effects a cure," savors of "presumption and effrontery" of the most glaring kind, and is calculated by its boldness to excite the hope of thousands of unfortunate invalids only to precipitate them in disappointment.

Apart from these undeserved claims, we believe that an aqueous solution of iodine is a valuable form for the administration of that remedy, and one toward which physicians should turn their attention. It is not at all improbable, as we said before, that the careless use of an alcoholic solution of iodine frequently occasions gastric irritation: and even Lugol's solution, if not properly diluted, may do the same; yet we believe that six drops of Lugol's solution (containing a quarter of a grain of iodine) diluted in a table spoonful of water, will be equal in all respects, so far as regards the specific effects of iodine, with a like quantity of "Iodine water." As it is

perfectly easy to prepare an aqueous solution with a quarter of a grain to the table-spoonful, by aid of spontaneously generated hydriodic acid, as before alluded to, its administration in this form to children of scrofulous habits, where iodine treatment is to be long persisted in, is certainly a safe and eligible method.

Dr. Anders' remarks in reference to what we said about sweet spirits of nitre and iodide of potassium he had better have omitted, as he has totally misunderstood our meaning and aim.

Finally we will remark that Dr. Anders' declaration, in his concluding paragraph, that "iodine is never wholly dissolved by aid of iodide of potassium, hydriodic acid, etc.," is entirely incorrect and unchemical; such solvents have no analogy to the alcohol in tincture of iodine, which by mixture with water necessarily loses its solvent power, and suffers the iodine to be precipitated in a solid form, whilst in the other cases no amount of dilution causes them to precipitate the iodine.

Dr. Bache (U. S. Disp. 10 Edit. 413-1341) so far from disapproving of these solvents, quotes Dr. Buchanan, of Edinburg, to show that hydriodic acid is the best form to exhibit iodine to get its specific effects without irritation, and that iodine taken in a free state becomes hydriodic acid in the stomach by contact with organic matter.

Dr. Wood (*Therap. and Pharmacol.* ii. p. 342) says, "the probabilities are that, when swallowed, or brought in any other way in contact with the fluids of the body, it undergoes changes through the reagency of the alkaline salts which it encounters, by which a portion of it is converted into iodide of potassium or sodium," &c., and further on he says, "so that it would seem impossible for iodine to enter the blood in its uncombined state."

**THAYER'S SOLID EXTRACTS.**—Dr. Henry Thayer, of Boston, has sent to us specimens of Extracts of Taraxacum, Juglans, Uva Ursi, Humulus Hyoscyamus, Belladonna and Conium, all of which are marked "by displacement—in vacuo," which we presume means that the substances were extracted by displacement and the solutions evaporated in vacuo. The appearance of these extracts is good. Their consistence rather soft for making pills, though convenient for some other purposes of pharmacy. The Taraxacum has a brown color and decided odor of the bruised root, with a fair proportion of its bitterness. There is probably no extract that varies so much as made at different times and by different manufacturers. The extract of Conium, so far as can be judged by appearance, taste, odor and chemical tests, is of excellent quality, but we have had no opportunity to have it or any of the others tried therapeutically. The Belladonna and Hyoscyamus are made from the imported leaves. All of the labels have the abbreviation "Purif." attached to the name; as, for instance "Ext. Conii Purif." We suppose this is intended to indicate that they are pure extracts and not purified extracts as the affix indicates, which might mean that they are made from materials requiring purification. The samples are enclosed in queensware jars, and are neatly put up.